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Environment Council of Alberta

1985 ANNUAL REPORT

Alberta
ENVIRONMENT COUNCIL OF ALBERTA

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Report May Be Obtained
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ISSN 0705-5811
ECA 86-AR

Letter of Transmittal

Lieutenant-Governor in Council
Legislative Building
EDMONTON, Alberta

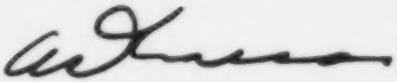
Honorable F. Bradley
Minister
Department of Environment
132 Legislative Building
EDMONTON, Alberta

Sirs:

I have the honor to transmit herewith, the Annual Report of the Environment Council of Alberta for the year 1985 as required by Section 7(1)(h)(i) of The Environment Council Act.

I have the honor to be Sir,

Your obedient servant,



A.D. Crerar
Chief Executive Officer
Environment Council of Alberta

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1. MESSAGE FROM THE CHIEF EXECUTIVE OFFICER

During 1985, the two major tasks of the Environment Council were the completion of the Report and Recommendations of the Public Hearings on the Maintenance and Expansion of the Agricultural Land Base, and the launching of a Provincial Conservation Strategy. These two tasks illustrate two of the major functions and strengths of the Environment Council: to undertake public hearings and to utilize the representative nature of the Public Advisory Committees to identify and respond to concerns about the environment of Alberta.

It was in March that the *Technical Report and Recommendations* on the agricultural land base hearings was released. This report provides the detailed technical information and the comments and suggestions from the Public Hearings that support the conclusions the Panel advanced in December 1984 in the Summary Report.

The Technical Report confirmed that the major reason for the protection of the agricultural land base is to maintain a viable, efficient food industry capable of competing for market share on a worldwide basis. To achieve this objective, the Panel developed recommendations that would provide graduated protection for high-productivity agricultural land and for the replacement, on an equivalent basis, of any productive land lost. Alberta is not short of high-cost—low-productivity lands. Much exists and more could be added when world markets warrant. What we are short of is agricultural lands that, with moderate inputs, are capable of achieving high productivity. A number of recommendations to conserve such lands were developed.

The other major threat that the agricultural land base faces is the reduction in productivity due to erosion and soil degradation. Erosion is the process whereby the soil itself is removed from the field by the action of either wind or water. It takes a number of different forms and is a normal, natural process that occurs continuously. In the natural environment of the Prairies, however, the rates of erosion are normally less than the rates of soil building. Native plants and grasses grow and die. During their life, they bind the soil and utilize available moisture. After their death, their organic matter decomposes to enrich and consolidate the soil, nurture micro-organisms, and permit water to penetrate. Though some soil loss persists, soil quality improves rather than deteriorates.

Soil degradation includes excessive rates of erosion, but also encompasses phenomena such as salinization, acidification, loss of nitrogen and organic matter from the soil, and deterioration of soil structure, all of which can take place without the actual physical loss of soil.

Agricultural practices can either enhance or inhibit soil degradation. The continuous planting of a single crop, excessive cultivation, not leaving stubble up over winter, over-groomed seed beds, and a number of other practices predispose the land to soil degradation and erosion. This need not be. Up to 43 percent of

Alberta farms on soils with low levels of organic matter (for example, Grey Wooded Soils) exhibited increases in soil organic carbon over time, a good generalized indicator of improving soil health, and increasing levels of organic matter in soils. But there are lands being broken that should not be and there are continuing agricultural practices that need to be changed. To enhance the current useful efforts of Alberta Agriculture, the Panel had a number of recommendations that were intended to protect agricultural land from uses and practices that would lower its quality and productivity.

A major thrust of the Report was to put greater responsibility on the level of government closest to the problem – the local municipality – and to rely as much as possible on market mechanisms and price incentives to move actions and responses in the desired direction. Legislated prohibitions and rigid regulations did not seem appropriate solutions to the Panel and more appropriate alternatives were sought and found.

The recommendations of the Panel were based on the 276 briefs presented to panel members from Albertans representing organizations, professional groups, local governments, or their own personal views. These submissions were supplemented by extensive discussions with government departments and agencies that were concerned and knowledgeable about the situation. The Panel's own extensive background, practical knowledge, and good common sense was applied to all the information, viewpoints, and suggestions. The result was recommendations that would tackle the problems of maintenance of the agricultural land base and the expansion of a viable agricultural industry in a way that the Panel felt was feasible, practicable, and acceptable to Albertans. For further information, please refer to the ECA publications *Maintaining and Expanding the Agricultural Land Base in Alberta: Summary Report and Recommendations* and *Technical Report and Recommendations.*

The recommendations of the Agricultural Panel were intended to show how the agricultural land base could both be used and conserved. It is the wrong use in the wrong place that is the problem, not use itself. Certain areas are capable of growing crops on a continuous basis; other areas should only be used for grass and forage. Still other soils can be maintained if forage rotations are used on a regular basis to maintain soil organic matter. Even urban and industrial uses can be accommodated on agricultural soils if their loss is compensated for by a replacement with an equal measure of productive land, or if agricultural research or investment in soil amendments to fully compensate for lost productivity are adopted. Development on agricultural lands will occur. What can be done is to ensure that such development occurs in areas where its impact is minimized or, when there is no alternative but to use high-quality agricultural soil, to ensure that the loss is permanently replaced by enhanced productivity through research or by amendment and upgrading of soil quality.

This is also a major message of the World Conservation Strategy. Development is essential. Development is the only means whereby our levels of living can be enhanced and the problems of poverty, particularly in the Third World, can be tackled. However, economic development need not be at the expense of environmental quality. Evidence from 15 years of pollution control and effluent reduction in OECD countries indicates that the impact of these programs on major economic indicators (GNP, inflation, and employment) has been negligible. This is not to say that certain industries and certain companies have not been markedly affected. They have. The application of the "polluter pays" principle identifies industries with high clean-up costs. Since prices for these "dirty" products must rise to cover clean-up costs, a powerful price signal is transmitted to the market, which directs buyers away from "dirty" and costly products toward substitutes that have lower clean-up costs and are hence cheaper. It is often suggested that it is not the polluter, but the customer, who pays. This neglects the fact that in free markets there is usually a choice or a substitute and the product with lower clean-up costs will be preferred over those whose clean-up costs are high.

Environment protection has been universally developed in a "react and cure" approach. A pollution problem is identified, then steps are taken to rectify and "cure" the problem. The deed or the action has to be undertaken, the effects and problems generated, before any action to rectify is taken.

An alternative approach to "react and cure" is to "anticipate and prevent." This requires a switch from a focus on the effects of environmental problems to the identification of the sources of such problems. Since the source of most environmental problems originates in ill-considered economic development, the need for a conservation strategy arises.

There may seem to be an inherent contradiction here. A familiar paradigm states that economic development is the source of most major problems in environmental conservation; therefore, to protect the environment, economic development must be halted. That, however, is a false dichotomy. If potential environmental problems are anticipated and appropriate action is taken early enough, most development can be accommodated without harm to the environment. Indeed many developments are, or can be, positively beneficial to the environment. There remain environmental concerns or objectives that should not be violated. If they are identified early enough and clearly enough, they serve as signals to developers of the environmental elements that must be respected, and because they are known and identified early, they are more readily avoided.

In the World Conservation Strategy, three major elements have been identified:

1) To maintain essential ecological processes and life support systems (such as soil regeneration and protection, recycling of nutrients, and the cleansing of waters), on which human survival and development depend;

2) To preserve genetic diversity;

3) To achieve sustainable use of species and ecosystems, notably fish and wildlife, forests, agricultural soils, and grazing lands.

These are principles that should not be violated. They are objectives on which there is worldwide agreement. The principles are subscribed to by developed and developing nations, by rich and poor, and by developer and conservationist. These elements will be incorporated into the Provincial Conservation Strategy since they apply to Alberta as well as every other part of the globe. However, there are other elements of a conservation strategy that apply distinctly and uniquely to Alberta. To identify these special Alberta elements and to add them to the objectives of the World Conservation Strategy is a principal task of a provincial conservation strategy.

The Public Advisory Committees are uniquely suited to undertake the development of a provincial conservation strategy. They are widely representative, with members from a large number (124) of province-wide organizations. They also represent many points of view, from urban to rural, from highly skilled professional to concerned laymen, and from conservation to development.

To be useful and effective, a provincial conservation strategy must identify principles on which there is a broadly based consensus. It is not the place of a conservation strategy to protect special interests or to advocate some particular concern. The principles identified must be those on which there is a large measure of agreement across a broad spectrum as to their importance in the maintenance of the integrity of the Alberta environment.

During 1985, the Public Advisory Committees achieved the development and, at their Annual Joint Meeting, the unanimous adoption of a Prospectus for an Alberta Conservation Strategy. A prospectus for a conservation strategy has exactly the same role as a prospectus for new stock shares. It identifies what it is that is proposed, how it might be achieved, who might be involved, and the time it might require. It is not a strategy (any more than a prospectus is a stock), but it attempts to explain as fully and carefully as possible what the strategy will consist of.

In addition to the three elements of the World Conservation Strategy that will be incorporated into the Provincial Conservation Strategy, three elements unique to Alberta have been suggested in the Prospectus. They are:

4) To provide for the recreational, spiritual, aesthetic, and other non-material needs of Albertans by maintaining and developing diverse opportunities for the use of natural resources;

5) To maintain and improve the quality of life in the urban environment, where the majority of Albertans now live and work;

6) To use and manage our non-renewable resources in the interests of developing a long-term sustainable economy for Albertans.

In 1986 will begin the task of identifying, with as much precision as is possible, what each of these general objectives means and what the implications for Alberta might be. The result will be an Alberta Conservation Strategy. If the current timetable can be adhered to, a draft Strategy should be well underway by the end of 1986. Following the development of a draft Alberta Conservation Strategy, there would be an opportunity for the Environment Council to take the draft Strategy to public hearings to obtain viewpoints and comments from as wide a range of Albertans as possible.

Such a procedure would require the fullest use of all of the Council's capabilities and resources, both those of the Public Advisory Committees and those of the staff and panel members in the public hearing process. However, if the Alberta Conservation Strategy is going to fulfill the role that it should, nothing less than a maximum effort will suffice.

Alistair D. Crerar
Chief Executive Officer,
Environment Council of Alberta

2. POLICY AND PROGRAM REVIEW

The Council...
...shall conduct a continuing review of policies and programs of the Government....

Section 7(1)(a), The Environment Council Act

The Environment Council Act requires the Council to carry out an ongoing review of Provincial environmental policies and programs. This is done through the public hearing process, through reports created by research staff, and through the activities of the Public Advisory Committees.

2.1 REVIEW OF AGRICULTURAL LAND BASE POLICIES AND PROGRAMS

The Agricultural Land Base Panel completed its *Summary Report and Recommendations* in December of 1984. This was followed in March of 1985 with the 198-page *Technical Report and Recommendations*. Research staff assisted the Panel in the preparation of both reports.

The Technical Report repeats the recommendations made in the 1984 Summary Report, but includes many references to the considerable information derived from the public hearings and other sources. It also provides background on Alberta's position in present and future international agricultural markets.

About 90 percent of Alberta's agricultural production is either sold directly into the international marketplace, or priced according to market values primarily established there. Grain markets are probably growing while there is considerable concern about the long-term viability for red meats. These market situations have substantial implications for the maintenance of a high-quality agricultural land base in Alberta. A major concern is the need for a livestock industry in the province because of the contribution of forage crops, pasture, and animal wastes to soil quality. This concern is reflected in several of the recommendations.

Most input costs in the primary agricultural sector are established outside Alberta, with the exceptions of farmland prices and farm wages. The land element is a growing component of input costs. In this partially controllable situation, two things are required if Alberta is to remain competitive on a world scale:

1) there must be full and continuing utilization of agricultural land capable of producing reasonable yields without excessive input costs, and

2) agricultural land prices should be primarily based upon the expectations of continuing returns from agricultural production.

There are opportunities to increase provincial agricultural production. However, the highest net returns will come about through the intensification and management of the best land. This advantage should not be wasted or squandered.

The above is the context for many of the recommendations made by the Agricultural Land Base Panel. The pattern of the recommendations is as follows:

1) There is an emphasis on improving the information base upon which all public and private decisions are made. For example: the creation of an Agricultural Resources Conservation Board that makes an annual report to the Legislature on the status of the land base, the requirement for regional planning commissions to identify growth options that recognize the importance of the agricultural land base, research and technology transfer programs in many areas, and ranking of expansion and intensification programs, utilizing economic information.

2) Decision making should be shifted toward the local level while retaining a provincial perspective. Those making decisions should be most affected by those same decisions. This pattern can be seen in recommendations that place responsibility for the maintenance of agricultural land at the municipal level and in a strengthened role for the Agricultural Service Boards, along with provision for a provincial overview through the Agricultural Resources Conservation Board.

3) Decision making in the agricultural sector should reflect market mechanisms whenever possible. An example is Recommendation 5, which states:

   The agricultural production lost when land is removed from agriculture should be replaced either by support of agricultural research and development or by practices and programs which would permanently replace the lost production.

   By making lower quality land more attractive and higher quality land less attractive (because of the level of agricultural productivity that must be replaced either directly or through contributions to the Agricultural Productivity Compensation Fund), market mechanisms are employed to bias decisions in favor of conservation of our better quality soils.

4) In some circumstances, special approaches are required to facilitate conservation of high-quality lands. Examples here include: the establishment of Soil Reclamation Districts, making crop insurance neutral with regard to cropping summerfallow or stubble fields, and improvement of the beef marketing system.

For further information on the recommendations of the Agricultural Land Base Panel, please refer to the Summary and Technical Reports. These are available, without charge, from the ECA Library.

Following the publication of the Technical Report, the Agricultural Land Base Panel discussed the Report and Recommendations with many organizations throughout Alberta. The breakdown is as follows:

Agricultural Organizations	16
Government (including Planning Commissions)	9
Environmental Organizations	7

Political Organizations	2
Other	2
Business Organizations	1
Total	37

2.2 MINISTERIAL REPORTS

The Environment Council Act enables the Environment Minister to request the Council to undertake an investigation of any matter pertaining to environment conservation and to make a report on the matter to the Minister. The former Minister of the Environment, the Honorable Jack Cookson, requested such an investigation on the effectiveness of the Clean Air and Clean Water Acts. Staff reports were completed on these matters during 1985 and these are available from the ECA library.

The reports of the Council to the Minister as required under the Environment Council Act, Section 7(1) (i)(ii), follow:

2.2.1 Report on the Clean Air Act

This report presents the main findings and recommendations of the Environment Council's review of the Clean Air Act (RSA 1980, chapter C-12), its associated regulations, policies and related programs. It is based upon a staff report written by ECA staff (Gordon and Free 1985).

THE PURPOSE OF THE AIR QUALITY MANAGEMENT PROGRAM

Ambient air quality standards form the cornerstone of Alberta's air quality management program. All associated management programs are designed to ultimately protect ambient air quality. The process by which air quality standards are set was examined by Franson et al. (1982). The first requirement is to have a clear goal for the air quality management program. For example, is our goal for air quality the protection of human health or some aesthetic objective? Do we intend to manage our air quality to protect other elements of Alberta's environment, such as plant life or soils? Alberta Environment does have a general goal: promoting a balance among resource management, environmental protection and the quality of life. The Department's Pollution Prevention and Control program is intended to prevent and control pollution in order to protect the environment and our quality of life (Alberta Environment 1977). An explicit goal for the management of air quality is needed to give clear direction to the standard-setting and enforcement programs.

Identifying this goal for air quality management is not exclusively, or even mainly, a technical matter but should satisfy the needs and desires of Albertans. The Department should seek public consultation during the formulation of such a goal not only to assist in standard definition but to facilitate public acceptance of the standards developed.

Recommendation 1

An explicit goal for air quality management should be developed with public input.

SETTING AMBIENT STANDARDS

Given a clear, publicly supported goal, specific targets or standards for contaminants in the ambient air can be established. Most of Alberta's ambient standards are set out in the Clean Air (Maximum Levels) Regulation (AR 218/75) with others described in various guidelines, directives and reports. Several of the standards in the Maximum Levels Regulation were adapted from the National Air Quality Objectives which were developed by a subcommittee of the Federal-Provincial Committee on Air Pollution. The scientific criteria on which these objectives are based have been published by the federal government (Fisheries and Environment Canada 1976). For other standards in the regulation and for many of the guidelines used by the Department, no criteria have been published. A single document bringing together all of Alberta's ambient air quality standards and the criteria on which they are based would be very useful for government administrators, industry and the general public.

Recommendation 2

Alberta Environment should publish a single document containing all of Alberta's ambient air quality standards and their associated criteria.

Setting ambient standards is not entirely a technical matter. In view of the paucity of conclusive research on health and environmental effects of air contaminants, a considerable amount of judgement is needed to assess the risks and to select the most appropriate standards. The public should be consulted to assist the government in making these difficult decisions. This would also increase public awareness and support for these standards.

Recommendation 3

Provisions should be made to allow public input during the development of ambient air quality standards.

INDUSTRIAL EMISSIONS

By setting ambient air quality standards, we acknowledge that there is a limit to the amount of air pollution that our society will tolerate. This in turn limits our capacity for industrial development since some industrial emissions can degrade ambient air quality. The current strategy for controlling industrial air contaminants is to reduce the quantity of emissions as much as practicable and then dilute the residual. Emission stacks are designed to have sufficient height to adequately disperse the air contaminants and to keep ground-level concentrations below the ambient standards.

The Department has a policy favoring the use of the environment's capacity to assimilate industrial emissions. "Assimilation" refers to the incorporation of materials into biological systems. The capacity of the atmosphere to dilute contaminants is substantial, but its assimilative capacity is very limited. Most air contaminants are simply diluted and dispersed over long distances. Although the impact of these contaminants on the environment is difficult to measure, it is important to recognize that they are not primarily assimilated and rendered innocuous, but contribute to the degradation of environmental quality by small amounts over widely dispersed areas.

The Department views the assimilative capacity as a resource to be utilized. This suggests that where the "assimilative capacity" is perceived to be under-utilized, increased emissions from industrial facilities could be equally acceptable to treatment to high standards. Every increase in emissions, however, reduces our ability to accommodate future industrial growth, unless future technology is capable of reducing or eliminating industrial emissions in line with declining assimilative capacity. The Department should shift its focus from the utilization of the assimilative capacity to its protection and preservation.

Recommendation 4

> *Alberta Environment should reassess its policy regarding the utilization of the "assimilative capacity" of the environment for waste disposal.*

SETTING EMISSIONS STANDARDS

The federal government has established National Emission Standards for certain air contaminants from several Canadian industries. The Alberta government has also included emission standards in the Clean Air (Maximum Levels) Regulation. In addition, Alberta Environment has developed emission guidelines for several industries and incorporates these into permits and licences issued to companies under the Clean Air Act. Setting emission standards is largely a technical matter. If the public has had sufficient input in setting the goal for air quality management and in setting ambient standards, public input to emission standards is not necessary.

Emission standards are usually based upon "best practicable technology." However, for certain especially harmful contaminants, such as lead and vinyl chloride, "best available technology" is used. To determine which technology is "best practicable" or "best available," a government-industry task force is used. The emissions associated with the chosen technology are used by Alberta Environment in establishing regulations for the industry.

The use of technology-based emission standards has certain disadvantages from the point of view of pollution control. In such a system, emission standards are tailored to the technology, rather than the technology being tailored to meet emission standards. There is little incentive for industry to seek methods of improving pollution control beyond existing requirements. The introduction of economic incentives, such as emissions charges or special taxes, would encourage industry to improve their performance, and switch their objective from meeting the requirements and regulations at the lowest cost to reducing levels of emissions at least cost.

Recommendation 5

> *The use of economic mechanisms to encourage industry to limit emissions should be examined and, for a selected industry, a pilot project should be mounted to test the operational feasibility of economic controls.*

REGULATING INDUSTRY

The Clean Air Act provides the means for implementing the standards and guidelines developed by government. Permits are required to construct industrial facilities and licences are required to operate them. Conditions may be attached to these permits and licences that prescribe aspects of project design, emissions limits, monitoring requirements and reporting procedures.

The Clean Air Act, its regulations and associated guidelines and policies provide for a wide variety of exemptions. For example, many of Alberta's emission standards do not apply during start-up, shut-down, equipment malfunction and emergency conditions. Not all industrial facilities are required to obtain permits or licences. In addition, certificates of variance can be issued to waive regulations or licence requirements. Considerable discretion is given to Department officials in applying some of these exemptions. However, there is insufficient direction in the legislation regarding the application of this discretion. An approved set of policies or guidelines is needed to clarify the application of this discretion.

Recommendation 6

> *Guidelines for the application of administrative discretion in allowing exemptions from emissions standards should be developed to clarify this aspect of*

regulation for Department administrators, regulated industry and the interested public.

MONITORING AIR QUALITY

Another important component of Alberta Environment's air quality management program is the monitoring of air quality. It is important to monitor ambient air quality to ensure that acceptable air quality is being maintained. It is also necessary to monitor industrial emissions to ensure that regulations and licence conditions are being met.

In Edmonton and Calgary, the Department operates an extensive ambient air quality monitoring network with several contaminants monitored continuously and others on a cumulative basis. Public awareness of this monitoring effort is not very great. The annual monitoring reports should receive greater distribution to acquaint the public with this activity of the Department and the quality of the ambient air. The twice-daily air quality index (IQUA) is also underutilized by the public and the media. The phone number for the IQUA is not even listed in city telephone books. The IQUA should be promoted further.

Recommendation 7

An effort should be made to promote public awareness of the Department's urban air quality monitoring activities.

Fort McMurray and Fort Saskatchewan also have continuous monitoring stations. Other major centers, such as Lethbridge, Medicine Hat and Red Deer, are monitored occasionally with mobile monitoring trailers. These monitoring episodes are not part of a planned long-term monitoring program, but are usually performed in response to special requests or problems. A regular monitoring program is warranted in these communities.

Recommendation 8

A more comprehensive air quality monitoring program for larger urban communities, such as Lethbridge, Medicine Hat and Red Deer, should be examined. The particular needs of smaller communities with unique industrial emission problems should be considered. This might include communities like Hinton, Bonnyville, or Rocky Mountain House where a seasonal cycle of air monitoring could be undertaken every few years, or at stages in their industrial development.

Monitoring of industrial emissions is performed primarily by the companies themselves. Companies report their emission levels to the Department with explanations

for contraventions that may have occurred. It is very important to ensure that company monitoring data are credible and accurate. To this end, the Department has issued several Air Monitoring Directives that specify detailed requirements for monitoring and reporting. A Performance Code has been issued for manual stack surveys and a code for continuous monitoring is currently being developed by the Department. The Department also conducts a quality assurance program that includes witnessing of manual stack surveys, inspecting instrument calibration, and several other activities. Recent public skepticism concerning industry self-monitoring may be reduced by publicizing the quality assurance program.

Recommendation 9

The Department's quality assurance program for company monitoring data should be re-evaluated to determine its adequacy. Steps should be taken to inform the public about this program.

ENFORCEMENT

The information derived from air quality monitoring allows the Department to react to air quality problems. With respect to industrial emissions, contraventions of licensed or legislated emission limits require some form of government action. A wide selection of enforcement tools are available including technical discussions, air quality directives, emission control orders and stop orders. Prosecution is also available. The Department currently favors negotiating compliance over a more adversarial approach to enforcement. Although this policy has certain advantages, the willingness to prosecute must be clearly established in order to provide the Department with adequate leverage in the negotiation process. A further incentive to pursue prosecutions is to develop a greater familiarity with the legal provisions in the Clean Air Act and associated regulations and to identify any weaknesses in this legislation.

Recommendation 10

The Department should examine its policy favoring negotiation of compliance to ensure that the willingness to prosecute is clearly established as an option in both the industry and public mind.

OTHER SOURCES OF AIR POLLUTION

Although the Clean Air Act and associated regulations provide an adequate basis for regulating industrial emissions, other sources of air pollution need to be addressed. These sources of pollution can also restrict ability to absorb future growth and development while maintaining high standards of air quality. In Calgary and

Edmonton, automobile emissions contribute substantially to urban air pollution. Although automobile emission standards are set by the federal government, additional action is needed, in the area of public education, better maintenance of automobiles and the potential for car-pooling and the use of public transit.

Recommendation 11

Alberta Environment should investigate how sources of air pollution not regulated by the Clean Air Act should be reduced.

RESEARCH

Scientific research into the effects of air contaminants on health and the environment is limited. Furthermore, not all such research conducted elsewhere is relevant to the Alberta situation. Such information is necessary in determining appropriate standards for ambient air quality. In addition, exceedances of certain ambient air quality standards occur with regularity in some Alberta communities. Research into the causes of these contraventions and the actual effects on health or the environment are warranted. The Alberta government has already funded some relevant research through the Environmental Research Trust, Alberta Environmental Centre and the Department's Research Management Division. Support for this kind of research should be continued. The current Acid Deposition Research Program is an excellent example of this approach.

Recommendation 12

The Provincial Government should encourage and support further research into health and environmental effects of air contaminants in Alberta.

CONCLUSION

Although the Clean Air Act and its associated regulations, guidelines and policies constitute a reasonably tough stand against air pollution, the Environment Council has identified several areas where improvements could be made. Weaknesses were found in some of the fundamental components of the air quality management program: no explicit goal for air quality management and inadequate opportunity for public input to ambient air quality standards. Other suggestions are made to improve public awareness of Department activities and to evaluate sources of air contaminants not regulated under current provincial programs.

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2.2.2 Report on the Clean Water Act

This report presents the main findings and recommendations of the Environment Council of Alberta's review of the Clean Water Act (RSA 1980, chapter C-13), its associated regulations and policies, and its role in the management of water quality in Alberta. It is based on a report written by ECA staff (Lilley 1985).

SURFACE WATER QUALITY

A review of water quality data over the past 10 years shows a statistically significant improvement in nitrite and nitrate levels in the North Saskatchewan River. Other changes, both improvements and deteriorations, may have occurred, but they were not statistically significant. Other reviews have noted improvements in some aspects of water quality in the North Saskatchewan River and in the Bow River.

It is heartening, in light of Alberta's rapid growth in population and industrial capacity, that water quality has not deteriorated and may have improved. However, the results also show that Alberta's Surface Water Quality Objectives for some parameters are frequently exceeded at a number of locations downstream of the major municipalities. Alberta, therefore, must continue with its efforts in pollution control.

Recommendation

> *Alberta Environment should undertake a comprehensive study of the status of the province's water quality.*

Although several reports on surface water quality have been published, no comprehensive study is publicly available. A comprehensive study would provide Alberta Environment and the public with an overview of the state of Alberta's water quality. This study should describe the present situation; identify trends in water quality; determine major contaminant sources, separating background levels from anthropogenic contributions; and pinpoint areas of potential concern. Used in conjunction with provincial goals for surface water quality, this study could aid in priority planning for pollution control, assist in the development of long-range policies, and assist in determining future licence conditions.

DEVELOPMENT OF A STATEMENT OF WATER MANAGEMENT GOALS, POLICIES, AND OBJECTIVES

The Clean Water Act has played an essential role in protecting water quality in Alberta. However, the effectiveness of the Act would be substantially enhanced by the addition of two elements: stated goals for water quality management and a process by which these goals are expected to be achieved.

Alberta Environment has a general goal for water quality of controlling pollution to protect the environment and the quality of life. However, neither "environment" nor "quality of life" have been defined. In addition, the Province has numerical objectives for water quality. These objectives, however, do not contain a statement of policy for water quality management nor do they identify a mechanism for implementation of a policy, if such a policy were to exist. There is no explanation of how the objectives will be applied, or of their relationship to the Department's responsibility to licence releases of environmental contaminants.

It is normal practice in a large and complex business enterprise to devote a great deal of effort to the establishment of precise goals for the enterprise and the policies and implementation procedures that will lead to achievement of these goals.

In this connection, the Ontario Water Management Goals, Policies, Objectives, and Implementation Procedures (Ontario Environment 1984) provide a model that Alberta Environment should consider.

Recommendation

> *The province should develop a clear statement of goals for water quality, the numerical objectives which should achieve these goals, and a statement of policies and guidelines to provide direction for efforts towards them. Much of the material necessary to develop such statements already exists in the Surface Water Quality Objectives.*

An explicit statement of policy would make the public and all water users more aware of the Government's intentions, provide stable goals for municipal governments and industrial developers, and provide a clear standard against which success in implementation and enforcement could be judged. Such a clear statement of policy would also be valuable for Department of Environment staff in providing a continual reminder of what it is that the regulations and permits they administer are expected to achieve.

The public also have a role to play in providing guidance to water quality managers and to governments with respect to the value judgments inherent in environmental protection. Public input, when added to the technical and scientific base, enables decision makers to make more informed judgments about the province's water quality goals and objectives.

WATER QUALITY MANAGEMENT CONCEPTS

Recommendation

> *Any change from the concept of water quality objectives which protect the most sensitive use towards the concept of beneficial use should occur only after a thorough review of the implications and consequences.*

Beneficial use is a concept wherein the numerical values for water quality objectives depend on the use of the water, instead of having a single set of objectives applicable to all water bodies and aimed at protecting the most sensitive use. There are indications that the approach to water quality management in Alberta is changing from the approach of protecting the most sensitive use towards the concept of beneficial use. This change is occurring in the absence of clear goals such as are available in Ontario, but it may be that in the unique circumstances of Alberta the beneficial use concept is a more appropriate approach to water quality management. However, this change of direction should be adopted only after the most thorough review, both internally and through public consultation, of the implications and consequences.

PRAIRIE PROVINCES WATER BOARD

The activities of the Prairie Provinces Water Board (PPWB) also influence Alberta's approach to water quality management. The PPWB has considered the use of basin-specific water quality objectives and apportionment of the assimilative capacity in their planning activities. These concepts also have been developed for planning purposes in the South Saskatchewan River Basin Planning Program. However, recently the PPWB has been studying other methods, such as a "two-level system" for the determination of water quality requirements for interprovincial

rivers. Water quality management within Alberta will be affected by the approaches ultimately adopted by the Board.

Recommendation

In its assessment of surface water quality objectives, the Province, as a participant in the PPWB, should consider the implications of the water quality management approaches which the Board is introducing.

CO-ORDINATION OF WATER QUALITY MANAGEMENT PROGRAMS

Although the Clean Water Act is Alberta's most significant piece of legislation affecting water quality management, other Acts administered by Alberta Environment and Acts and programs implemented by other departments also affect water quality.

For example, the Department of Energy and Natural Resources, although it does not directly have a mandate for water quality management, has been designated responsible under the federal Fisheries Act for protection and management of the province's fish resources and for enforcement of the Fisheries Act. There is an obvious relationship between fish habitat and management of water quality by Alberta Environment.

Generally, Alberta Environment has developed an efficient and co-ordinated approach to dealing with interdepartmental aspects of water management, but the distribution of responsibilities between these two departments, as well as uncertainties about jurisdictional overlaps between the Fisheries Act and the Clean Water Act, have created some difficulties. The two departments need to work closely together to establish common objectives and integrate complementary programs.

Recommendation

Policies and programs should be co-ordinated to ensure that the environmental protection activities of Alberta Environment are supportive of, and supported by, the programs of Alberta Energy and Natural Resources, with respect to protection of fish populations and habitats and enforcement of the Fisheries Act.

ALLOWABLE VARIANCE

Throughout the Clean Water Act and its regulations, discretion is given to the Minister and the Director of Pollution Control for the establishment of licence conditions and enforcement of the provisions of the Act. While discretion to some

degree is essential, and while it can provide an efficient and flexible mechanism responsive to local economic, social, environmental, and technical aspects, its extensive use has created a credibility gap between departmental actions and public perception about the enforcement of environmental standards. While it may be logical and, from a technological point of view, eminently practical to recognize that 100 percent compliance is not possible, neither the terms and conditions of a licence nor the wording of the Act and the regulations acknowledge this. The public, therefore, sees a contravention as a violation, which should bring prosecution if observed, the favored public analogy being traffic violations. Licence conditions which give compliance expectations in the form of a permissible level of emission and an acceptable amount of variance, above which strict enforcement action would be taken, would provide a more appropriate base for enforcement. If emissions exceed the permissible level but are still within the acceptable limits for variance, enforcement action need only take the persuasive form of meetings or directives. A contravention of the acceptable variance could be treated as a violation requiring legal enforcement action, such as control orders or prosecution. This approach is little different from what occurs operationally at present. The difference is that enforcement action would occur within clear, explicit, and publicly identifiable boundaries. Administering the Act in this manner would contribute greatly to increasing public confidence in the Department of the Environment.

Recommendation

The concept of allowable variance in emissions should be incorporated into the licensing of effluent releases wherever technically feasible.

MAXIMUM CONCENTRATIONS IN EFFLUENT DISCHARGE

Enforcement capabilities under the Act would be improved if regulations were used to establish limits on maximum concentrations and amounts of contaminants in effluent discharges. Limits at least as strict could then be incorporated into operating licences. The establishment of limits through regulation would be particularly useful in the application of the "general prohibition" clause with respect to individuals or operations that do not require licences under the Act.

Because there are no regulations which prescribe limits for the concentration of contaminants in discharges or surface waters, releases of contaminants by non-licenced operations or individuals are only loosely controlled by the existing legislation and enforcement practices.

Recommendation

Regulations establishing limits for acceptable concentrations and amounts of contaminants in effluent discharges should be developed.

UNCONTROLLED SOURCES OF DISCHARGES

Uncontrolled sources of periodic effluent releases such as agricultural livestock operations, irrigation drainage systems, and storm water drains cumulatively have the potential to substantially alter surface water quality. While the regulations recommended above would assist in controlling these sources of contaminants, the resumption of strong growth in Alberta could lead to increasing problems with uncontrolled contaminant sources. A pro-active approach by the Department would avoid or mitigate potential problems.

Recommendation

> *Approaches to managing periodic but presently unlicensed discharges of contaminated water should be developed by the Department.*

MONITORING

Recommendation

> *Industries and the major municipalities should be required to expand their monitoring of releases of "exotic" contaminants.*

Industrial effluent guidelines usually specify levels for "traditional" contaminants. Requirements for other contaminants may be added to the licence at the discretion of the Director of Standards and Approvals and this has occasionally been done for some "exotic" substances. Monitoring in accordance with these specifications will provide a data base which could be useful in identifying any emerging problems and appropriate actions.

A similar situation exists for municipal effluents. The "recommended standards" for municipal effluents specify no objectives for heavy metals or other chemicals, except oils and phenolics. A municipality accepts industrial effluents according to its own criteria, and is responsible for meeting the provincial requirements respecting the release of sewage. Even for major cities which accept substantial volumes of industrial waste, licences usually specify limits only for BOD and non-filterable residues and not for parameters such as metals.

With increasingly complex industries and the addition of more chemicals to the environment, questions regarding the significance, safety, and control of these chemicals have arisen. Monitoring for presence and concentrations of "exotic" materials, coupled with information provided by the recommended comprehensive study on Alberta's surface water quality, would help Alberta meet the challenge of dealing with potential problems posed by "exotic" chemicals.

AVAILABILITY OF INFORMATION

The Water Quality Control Branch of the Pollution Control Division previously published summaries of industrial monitoring data that identified the rate of compliance for each licence holder, gave the annual volume of industrial effluent, gave information on a licencee's performance including comparative results of government sampling, and briefly commented on a company's pollution control activities. Summaries of municipal effluent monitoring or compliance have not been published. Publication by the Department of information including summary and compliance reports for municipalities and industries would increase public awareness of the Department's efforts in pollution control and could increase public support for the Department's activities.

Recommendation

The Department should publish reports providing summaries of industrial and municipal effluent releases and rates of compliance at least annually.

PUBLIC SCRUTINY OF ENVIRONMENTAL POLLUTION

Many environmental problems are identified as a result of public complaints. It would assist in the achievement of the Department's goals for environmental protection to encourage public vigilance and knowledge with regard to spotting and reporting instances of environmental pollution.

Recommendation

The Department should encourage reporting of environmental problems by the public.

DEPARTMENTAL SCRUTINY OF ENVIRONMENTAL MONITORING DATA

Since Alberta Environment does not conduct extensive monitoring on its own, the Department is heavily dependent on the provision of accurate information by facility operators in order to remain aware of possible contraventions, unauthorized releases, and potential problems. The Department's scrutiny of company-submitted environmental monitoring reports has proven to be a very important means of identifying environmental problems and initiating compliance actions. Departmental monitoring and plant inspections also play a role. These programs should be reviewed and assessed to ensure that they are being used to their fullest potential in environmental protection.

Recommendation

The Department should assess its program for review of environmental monitoring data and plant inspections to develop the most effective use of these programs in obtaining compliance.

THE ENVIRONMENTAL MANDATE OF THE ACT

Environmental concerns should play a greater role in the prevention of pollution. In the application of many provisions of the Act, consideration of environmental impacts is at the discretion of the Director of Standards and Approvals, the Director of Pollution Control, or the Minister. While environmental impacts are considered in the issuance of control orders and stop orders, as well as in other actions taken by the Department for implementing the provisions of the Clean Water Act, the Clean Water Act says little about environmental impacts. Environmental impacts are not part of the stated grounds for issuance of certificates of variance, control orders, or stop orders. Environmental considerations are specifically identified only with respect to the "general prohibition" clause (s. 17) in which reference is made to "fish, wildlife, livestock or plants" as well as human health and life.

Recommendation

Environmental impacts should be an integral part of the implementation of the Clean Water Act and their consideration should be explicitly allowed for in the legislation and regulations.

CLARIFICATION OF THE CLEAN WATER ACT AND ITS REGULATIONS

There also are several specific areas in which the wording of the Clean Water Act and its regulations could be clarified. The general prohibition clause in the Clean Water Act differs in wording from the prohibition clause in the Clean Water (General) Regulations. The prohibition clause in the Act refers to a substance which is likely to degrade or alter the water so that it "is or is likely to be rendered harmful to human health or life, fish, wildlife, livestock or plants" (s. 17) The prohibition clause in the regulations refers to "any substance capable of changing the quality of the water or causing water contamination" (s. 11). No cross-reference is made in the regulations to this resulting in water being rendered "harmful to human health or life, fish, wildlife, livestock or plants" as specified in the Act. The prohibition clauses would be improved if their intents were to be clarified and ambiguity removed.

One condition for issuance of a certificate of variance requires that the variance not be likely to result in "water pollution" that could be detrimental to life or health or

adversely affect property. By definition in the Act, water pollution does not occur unless regulations are violated. Since no regulations have been promulgated, the meaning of this condition is unclear. Amendment of the Act to refer to "water contamination," which is defined in the Act, rather than "water pollution," would provide a clearer statement of the conditions for a certificate of variance. A similar clarification applies to the use of the term "water pollution" in the conditions for issuance of a stop order.

Under the Clean Water Act, stop orders may be used against a source of water pollution which is considered by the Minister to be an immediate danger to human life or property or both. Under the Department of the Environment Act, a stop order may be issued for a broader range of activities, including those that are likely to cause destruction, damage, or pollution of a natural resource. This latter wording appears to be the operational definition used by the Department.

The conditions under which a stop order may be issued under the Clean Water Act should be more clearly specified to avoid confusion between the operational interpretation (based on the Department of the Environment Act) and the sense implied by the Clean Water Act.

CONCLUSION

The Clean Water Act and the regulations were found to provide a strong basis for the protection of water quality in Alberta. However, the ECA has developed several recommendations which would improve water quality management and enhance the role of the Act.

There is a need for a comprehensive review of the present state of Alberta's water quality and, with the assistance of the public, a need for development of clear goals and policy direction within which the Clean Water Act can be implemented.

It is recommended that regulations be used to establish maximum permissible releases of contaminants for all effluent discharges and that allowable variances be written into the licence conditions wherever feasible.

Other recommendations include development of approaches to managing unlicenced discharges, and routine publication of monitoring and compliance data for industry and municipalities. An effort should be made to encourage reporting by the public of environmental offenses. Several suggestions are made for clarifying the wording of the Act.

REFERENCES

Lilley, J. 1985. *Water Quality Management in Alberta: The Role of the Clean Water Act.* Draft. Environment Council of Alberta. Edmonton. 124 pages.

Ontario Environment. 1984. *Water Management – Goals, Policies, Objectives and Implementation Procedures of the Ministry of the Environment.* Ontario Ministry of the Environment. Toronto. 70 pages.

2.3 PUBLIC ADVISORY COMMITTEE ASSISTANCE

The Public Advisory Committees initiated a program in 1985 to develop a Provincial Conservation Strategy. That program is discussed in Section 4.5. The Research Division provided assistance to the Steering Committee responsible for this project.

3. PUBLIC HEARINGS

The Council...
...shall, on being requested to do so by an order of the Lieutenant Governor in Council, hold public hearings for the purpose of receiving briefs and submissions....

Section 7(1)(d), The Environment Council Act

3.1 RECYCLING

In 1984, the Honorable Fred Bradley, Minister of the Environment, announced that the next ECA public hearing would be on recycling. The Terms of Reference were released on February 20, 1985 (O.C. 106/85). They are:

The Environment Council of Alberta is hereby requested to:

1) *Enquire into the potential for the economic recycling of products presently disposed of as wastes; giving particular attention to:*

   a) *the potential, scope and obstacles to increased recycling by private sector business enterprises;*

   b) *the potential, scope and obstacles to increased recycling by volunteer organizations;*

   c) *the support role of local governments and the provincial government in facilitating recycling by the private sector and volunteer organizations, considering the potential reduction in waste disposal costs, the enhancement of the environment and privatization.*

2) *Consider the potential and comparative economics of the generation of energy from wastes when the alternative of the creation of useful goods and services from wastes is not feasible.*

3) *Hold public hearings at suitable locations throughout the province, and report to the Minister of Environment and the Lieutenant-Governor in Council on completion of the report.*

In preparation for the public hearings, a background information package was nearing completion at the end of 1985. It consists of eight reports and a film, all of which will be used in the prehearing information program.

3.1.1 Reports

1) **Garbage to Gold? Issues and Opportunities: Terms of Reference and Background Information** – provides the formal terms of reference and an indication of the scope of information available in the other information bulletins, and raises some of the issues that should be considered during the public hearings.

2) **Resource Recycling in Alberta** – discusses the recycling systems in the province covering oil, glass, rubber, metals, plastics, and paper, and some of the opportunities and constraints affecting recycling rates.

3) **A Social Perspective of Recycling in Alberta** – deals with recycling from a consumer and community perspective. The report describes the involvement of individuals and groups in recycling activities.

4) **Municipal Solid Waste : Alberta's Untapped Resource?** – a discussion of municipal solid waste disposal systems, how waste is collected, what goes into landfills, and what could be recovered at source or on site.

5) **Economic Barriers to Recycling** – a description of some economic obstacles to recycling and to increasing the supply of and demand for recycled products.

6) **Legislation, Policy, and Programs for Resource Recovery** – this report is being prepared by Alberta Environment for distribution by the ECA.

7) **The Use of Municipal Waste as Fuel** – a reprint of a report originally prepared for the Renewable Resources Study Group of the ECA's Public Advisory Committee on the Environment. It reviews literature related to the use of municipal waste as fuel for power generation and discusses some of the options that involve separation and processing of usable elements in the waste.

8) **Bibliography of Recycling** – a listing of useful recycling references.

3.1.2 Film

Cottonwood Consultants Ltd. of Calgary produced an audio-visual presentation on recycling, *One Man's Garbage – Another Man's Gold*. Funding for the project was shared with the Waste Management Branch of Alberta Environment. It will be used by the ECA during the course of the recycling project and for ongoing work on waste management carried out by Alberta Environment.

4. PUBLIC ADVISORY COMMITTEES

The Council...may...
...appoint one or more public advisory committees on environment conservation....

Section 10(a), The Environment Council Act

The Environment Council has three Public Advisory Committees appointed pursuant to the Environment Council Act (s. 10). These are the Public Advisory Committee on the Environment, the Science Advisory Committee, and the Environmental Education Advisory Committee. These committees constitute the volunteer arm of the Environment Council and are a major interface between the Government of Alberta and its citizens with regard to study and discussion of environmental matters. Two hundred and one dedicated individuals are currently members of the three Public Advisory Committees, an increase of four from the roster of 197 at the end of last year. A list of committee members as of November 1985 (excluding alternates) is presented in Appendix D.

4.1 THE PUBLIC ADVISORY COMMITTEE ON THE ENVIRONMENT

The membership of the Public Advisory Committee on the Environment consists of nominees of various organizations, associations, and institutions in Alberta, as well as individuals whose special capabilities are recognized by the Environment Council to be of exceptional value. At the end of the year, 124 organizations were represented, including six which were represented for the first time.

In order to function effectively, the Public Advisory Committee on the Environment is divided into six study groups and general areas of interest as follows:

Energy – energy conservation and alternative sources

Environment Protection – outdoor recreation, habitat protection, species diversity, wetlands

Non-Renewable Resources – impact of extraction, new technologies

Pollution – clean air, clean water, health hazards

Renewable Resources – management of forests, water, agriculture

Urban Environment – solid waste management, urban infrastructure, drinking water

Within the context of the Environment Council Act and the general areas of environmental concern identified, each study group sets its own agendas and determines the issues that the members wish to address.

As in past years, the primary function of the study groups lay in the identification and consideration of emergent environmental issues and problems. The study groups issued early warnings, expressed public concerns, and provided advice to Government on a number of these issues.

Items studied during the year included:

- Wind Power
- Alternative Fuels, Biomass, and Methanol
- Energy-Efficient Window Coverings
- Ecological Reserves
- Revised Eastern Slopes Policy
- Sale of Crown Land
- Nordegg—Red Deer Integrated Plan
- Agricultural Hearings Report and Recommendations
- Wetlands for Tomorrow
- Kimiwan Lake
- Wetlands Inventory Program
- Status of Fish and Wildlife in Alberta
- Three Rivers Dam
- Westcastle Development
- Four Mountain Parks Planning
- Soils at Risk – Senate Report
- Elkwater Townsite Expansion
- Sale of Grazing Leases
- Forest Land Use Zones
- Mediation and Environmental Concerns
- Reclamation of Gravel Pits, Coal Mines, etc.
- Lube Oil Recycling
- Natural Gas in Well Water
- Use of Undeveloped Road Allowances
- Natural Gas as Vehicle Fuel
- Heavy Oil Development
- Hazardous Waste Disposal
- Oil Sands Emission Technology
- Chemical Applications in Forests
- Indoor Air Quality
- Acid Deposition Research Program
- Grasshopper Spraying
- Water Quality
- South Saskatchewan River Basin Hearings
- Abandoned Railway Rights-of-Way
- Bill 84 – Wildlife Act
- Highwood River Diversion
- Cold Lake–Beaver River Water Management
- Noise Abatement
- Alberta Planning Act
- Municipal Waste Management
- Recycling

A number of these issues are discussed in greater detail in the annual reports of the study groups in Appendix A. Several of these issues became the subject of formal resolutions at the 1985 Annual Joint Meeting. These are reproduced in Appendix B. Many of these issues are not new, but represent ongoing public concern in these areas. As expressed in the chairmen's reports in Appendix A, members of the Public Advisory Committees appreciate the progress made with regard to some of these issues, but continue to be disappointed with the lack of progress in other areas.

4.1.1 Water Quality Workshop

On May 27, 1985, the Pollution Study Group held a water quality workshop. Seventy-six people attended, including representatives of cities and industry, and concerned citizens. Eight speakers addressed a variety of water quality topics.

This was a new approach to examining important public issues for the Public Advisory Committees. The workshop generated a high degree of interest and enthusiasm and was well-covered by the media. The workshop was most effective in getting interest for and feedback to all parts of the province. We look forward to using this approach for other issues in the future.

4.2 THE ENVIRONMENTAL EDUCATION ADVISORY COMMITTEE

The Environmental Education Advisory Committee is composed of professional educators and communicators from government, broadcasting and related industries, academic institutions, the teaching profession, and the public at large. Its purpose is to advise the Council and the Government on matters concerning environmental education, to comment on environmental programs both within and outside the formal educational systems, and to assist in the formulation, development, and implementation of such programs wherever possible.

During the past year, the Environmental Education Advisory Committee reviewed and commented on the environmental education programs of the following organizations :

- Energy Resources Conservation Board
- Fort Calgary
- Yamnuska Mountain School
- Camp YoWoChAs
- Parks Canada.

Work continued on the Environmental Achievement Awards, which the Minister of the Environment has agreed to present for the first time during Environment Week, 1986.

A more complete review of the work of the Committee is included in the chairmen's reports in Appendix A.

4.3 THE SCIENCE ADVISORY COMMITTEE

The Science Advisory Committee is a multi-disciplinary group, composed of scientists drawn from academic institutions, government, scientific agencies, and industry, whose purpose is to provide technical and scientific advice and assistance to the Council on matters that occupy its attention from time to time.

During the past year, the Science Advisory Committee completed reviews of three draft ECA reports on recycling. Special thanks is extended for their effort.

The Wildlife Sub-Committee and the Water Sub-Committee were both active during the past year. Issues dealt with by these two sub-committees and other activities of the Science Advisory Committee are reviewed in the chairmen's reports in Appendix A.

A special task is the Science Advisory Committee's short-term priority to expand and regenerate its membership. The Council looks forward to assisting the Science Advisory Committee in this endeavor.

4.4 THE CO-ORDINATING COMMITTEE

The Co-ordinating Committee is responsible for the overall co-ordination of the three Public Advisory Committees, including the study groups of the Public Advisory Committee on the Environment, to assure efficient functioning of the Committees. This is the central body that keeps the entire membership abreast of all the issues being dealt with by the organization.

During the past year, the Co-ordinating Committee continued to focus on improving the efficiency and effectiveness of the Public Advisory Committees. Considerable progress has been made in this regard. The report of the Chairman of the Co-ordinating Committee is included in Appendix A.

4.5 PROVINCIAL CONSERVATION STRATEGY STEERING COMMITTEE

A major topic throughout the year for the Public Advisory Committees was the development of a Prospectus for an Alberta Conservation Strategy. This project, which originated with the Renewable Resources Study Group, expanded to include input by all study groups as well as the Science Advisory Committee and the Environmental Education Advisory Committee. Under the auspices of the Co-ordinating Committee, a Conservation Strategy Steering Committee was established to oversee this project. A special thanks is extended to all who volunteered their time to work on this sub-committee. Progress to date includes the Annual Joint Meeting's unanimous endorsement of the Prospectus document as well as the unanimous approval of the resolution calling for future public hearings on this topic. The Public Advisory Committees will continue to work on the development of a conservation strategy for Alberta in the coming year.

4.6 RESOLUTIONS FROM 1984

Responses of the various government departments to the 1984 Resolutions were again consolidated by the Office of the Minister of the Environment. These responses

were forwarded to the Council in April and several of the study groups sent follow-up correspondence asking for further clarification. The complete text of the responses to the 1984 Resolutions appears in Appendix C.

Past resolutions continue to be a topic of discussion of the Advisory Committees. The Chairman of the Resolutions Committee has accepted the new responsibility of resolutions management and will make recommendations on improving the effectiveness of this important means of communicating the public's concerns to the Government.

4.7 THE ANNUAL JOINT MEETING

4.7.1 Location and Attendance

In keeping with fiscal restraint, the Annual Joint Meeting was again held in Edmonton. The meeting took place at the Van Winkle Motor Lodge on December 5, 6, and 7, 1985. Arrangements were most satisfactory. A chartered bus from Lethbridge with stops in Calgary and Red Deer provided transportation for those members from southern Alberta.

This year's meeting was well attended, with about 110 members actively participating.

4.7.2 Program

The theme of the 1985 Annual Joint Meeting was the Provincial Conservation Strategy. Considerable enthusiasm was shown for this topic and many positive comments were received, supporting the success of this year's meeting. Proceedings of the Annual Joint Meeting are available from the Council's Library under separate cover.

4.7.3 Resolutions

Following their normal practice, individual study groups presented resolutions to the plenary session of the Annual Joint Meeting. Six resolutions were presented, two from the Environment Protection Study Group and one each from the Coordinating Committee and the Renewable Resources, Urban Environment, and Energy Study Groups. The resolutions, as ratified at the Annual Joint Meeting, appear in Appendix B.

4.7.4 New Officers

Mr. Robert (Bob) Richardson of Calgary was acclaimed Chairman of the Coordinating Committee for 1986. He succeeds Dr. Sheri Dalton of Edmonton. Ms. Maryhelen Posey of Calgary was acclaimed Vice-Chairman, succeeding Mr. Bob Richardson, and will head the Annual Joint Meeting Planning Committee for 1986.

5. OTHER ACTIVITIES OF THE ENVIRONMENT COUNCIL

5.1 The Canadian Environmental Advisory Councils

The Canadian Environmental Advisory Councils met in Quebec City on October 10, 11, and 12, 1985. The Environment Council of Alberta was represented by the Chief Executive Officer, the Director of Research, and the Director of Liaison. The theme of the conference was the St. Lawrence River and its environment, a topic of critical concern to Quebec and the Maritimes. A secondary theme examined "Provincial Conservation Strategies" and the progress that is being made in various jurisdictions. As Alberta is further advanced and because of our unique ability to involve the broad expertise of the Public Advisory Committees, we are being closely watched by the other jurisdictions.

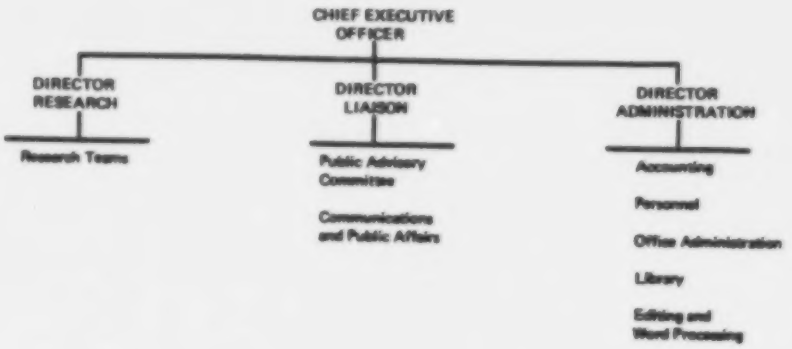
Alberta has agreed to host the 1986 Assembly. This is tentatively scheduled for late September or early October.

6. ADMINISTRATION

The Administration Division is responsible for providing services to the Environment Council in the areas of accounting, budgeting, editing, library, messenger, office management, personnel, print procurement, and purchasing.

The Council occupies the 8th floor, Weber Centre, 5555 Calgary Trail Southbound N.W., Edmonton.

6.1 ORGANIZATION OF THE ECA



1. CHIEF EXECUTIVE OFFICER - Exercises the power of the council and performs the duties and functions of the council, and is a member and Vice-Chairman of panels constituted by the Lieutenant-Governor in Council.
2. DIRECTOR, RESEARCH - Directs research officers and is responsible for the scientific activities of the council.
3. DIRECTOR, LIAISON - Directs assistance to the Public Advisory Committees; responsible for communications, public relations, and public affairs.
4. DIRECTOR, ADMINISTRATION - Directs and supervises the administrative systems—financial, accounting, personnel, editing, and word processing functions.

6.2 FISCAL REPORT

Funds for the operation of the Environment Council are provided under the Minister of Environment's Vote 8 — Overview and Co-ordination of Environment Conservation. These funds are transferred to the Council from the Department of Treasury on a monthly basis, and with the exception of salaries, are deposited in the Council's bank account at the main branch of the Canadian Imperial Bank of Commerce, Edmonton. Cheques are issued directly by the Council for payment of all accounts. During 1985, a total of 994 cheques were issued.

With the operation of its own bank account, the Council operates at arm's length from the Alberta Government; however, the financial statements are audited by the Office of the Auditor General. The financial statements as of March 31, 1985 follow.

ENVIRONMENT COUNCIL OF ALBERTA

FINANCIAL STATEMENTS

MARCH 31, 1985

Auditor's Report

Balance Sheet

Statement of Capital Surplus

Statement of Operations and Operating Surplus

Notes to the Financial Statements

OFFICE OF THE AUDITOR GENERAL

ALBERTA LEGISLATURE

OFFICE OF THE AUDITOR GENERAL

AUDITOR'S REPORT

To the Chief Executive Officer of the
Environment Council of Alberta

I have examined the balance sheet of the Environment Council of Alberta as at March 31, 1985 and the statements of capital surplus and operations and operating surplus for the year then ended. My examination was made in accordance with generally accepted auditing standards, and accordingly included such tests and other procedures as I considered necessary in the circumstances.

In my opinion, these financial statements present fairly the financial position of the Council as at March 31, 1985 and the results of its operations for the year then ended in accordance with the disclosed basis of accounting, considered appropriate in the circumstances, as described in Note 2 to the financial statements applied on a basis consistent with that of the preceding year.

F.C.A.
Auditor General

Edmonton, Alberta
September 4, 1985

ENVIRONMENT COUNCIL OF ALBERTA

BALANCE SHEET

AS AT MARCH 31, 1985

	1985	1984
ASSETS		
Current:		
Cash	$242,570	$407,550
Prepaid expenses	7,505	-
	250,075	407,550
Fixed:		
Office equipment, at cost	112,687	82,120
Less: Accumulated depreciation	77,492	59,375
	35,195	22,745
	$285,270	$430,295
LIABILITIES AND SURPLUS		
Current:		
Accounts payable	$ 21,474	$ 20,209
Surplus:		
Capital	35,195	22,745
Operating	228,601	387,341
	263,796	410,086
	$285,270	$430,295

The accompanying notes are part of these financial statements.

ENVIRONMENT COUNCIL OF ALBERTA

STATEMENT OF CAPITAL SURPLUS

FOR THE YEAR ENDED MARCH 31, 1985

	1985	1984
Balance at beginning of year	$22,745	$22,839
Add: Office equipment purchased from operations	30,567	12,860
	53,312	35,699
Less: Depreciation for the year	18,117	10,284
Disposal of equipment at net book value	-	2,670
	18,117	12,954
Balance at end of year	$35,195	$22,745

ENVIRONMENT COUNCIL OF ALBERTA

STATEMENT OF OPERATIONS AND OPERATING SURPLUS

FOR THE YEAR ENDED MARCH 31, 1985

	1985	1984
Revenue:		
Contributions by the Province of Alberta	$1,006,134	$1,367,934
Expenditure:		
Salaries	713,309	837,296
Travelling	130,675	208,956
Fees and commissions	84,467	108,457
Employee benefits	69,764	85,535
Printing	41,925	102,080
Equipment maintenance, office supplies and postage	35,684	33,199
Equipment rental	32,207	36,498
Equipment purchases	30,567	12,860
Advertising	14,764	36,156
Library	6,272	6,795
Telephone	3,646	4,904
Miscellaneous	1,594	8,336
	1,164,874	1,481,072
Settlement of claim	-	43,856
	1,164,874	1,524,928
Deficit for the year	(158,740)	(156,994)
Operating surplus at beginning of year	387,341	544,335
Operating surplus at end of year	$ 228,601	$ 387,341

ENVIRONMENT COUNCIL OF ALBERTA

NOTES TO THE FINANCIAL STATEMENTS

MARCH 31, 1985

Note 1 Authority

The Environment Council of Alberta operates under the authority of the Environment Council Act, Chapter E-13, Revised Statutes of Alberta 1980.

Note 2 Significant Accounting Policies and Reporting Practices

These financial statements have been prepared in accordance with generally accepted accounting principles except that fixed assets are charged to expense at date of acquisition. The fixed assets are also shown on the balance sheet at original cost less accumulated depreciation, with a corresponding credit to capital surplus. Depreciation is charged to capital surplus and is provided over the estimated useful life of the assets on the straight line method at a rate of 33 1/3% for computer equipment and software and 10% for the remaining office equipment.

A statement of changes in financial position is not provided as disclosure in these financial statements is considered to be adequate.

Note 3 Administration Expenses

Office furniture and accommodation are provided to the Council at no cost by the Province of Alberta and accordingly are not reflected in these financial statements.

Note 4 Comparative Figures

The 1984 figures have been restated where necessary to conform to 1985 presentation.

Note 5 Approval of Financial Statements

These financial statements were approved by management.

6.3 PERSONNEL

The number of full-time permanent salaried positions was reduced from 25 to 22 during the year as a result of downsizing in the public service.

All permanent salaried positions are under the purview of the Public Service Commissioner and the regulations issued by the Personnel Administration Office are applicable. Non-management and non-excluded staff are members of the Alberta Union of Provincial Employees.

6.4 LIBRARY SERVICES

The responsibilities of the ECA Library are :

1) to provide information and background material to support projects of the Council and its research staff;
2) to provide a source of environmental information for the general public;
3) to manage and distribute all Environment Council publications.

The library contains 6,899 books and government documents and subscribes to 135 periodicals and seven newspapers. The collection also includes an extensive file of newspaper clippings on environmental matters, maps, and a selection of general reference material.

6.4.1 Services to the ECA Staff

Loans to Council staff (excluding periodicals):	335
Periodical loans to Council staff :	310
Reference questions answered :	526
Material borrowed from other libraries (interlibrary loans):	508

6.4.2 Services to the Public

Inquiries received by phone, letter, or personal visits :	539
Interlibrary loans to the public and other agencies:	20

6.4.3 Publications

During the year, the Library was responsible for the distribution of a large number of publications and brochures.

Maintaining and Expanding the Agricultural Land Base in Alberta – Technical Report and Recommendations	2,016

Maintaining and Expanding the Agricultural Land Base in Alberta — Summary Report and Recommendations	8,499
1984 Annual Report	642
Miscellaneous Publications	5,936
Conservation Strategy Brochures	1,499
Total distributed	18,592

A complete list of Environment Council publications is appended to this report (Appendix E).

The ECA mailing list was revised and updated, and consisted of 12,467 addresses at the end of 1985:

General list:	1,998 addresses
Recycling list:	1,492 addresses
Total of all other lists:	8,977 addresses

In 1985, a change to in-house production of mailing labels resulted in considerable savings and provided for more accurate information.

Convenient local access to Environment Council information is available at a total of 47 depository libraries or "Information Centers" located throughout Alberta. A list of the Information Centers may be found in Appendix F. Transcripts of public hearings have a more limited distribution; these may be viewed at the locations listed in Appendix G.

6.5 EDITING SERVICES

6.5.1 Reports Published in 1985

Maintaining and Expanding the Agricultural Land Base in Alberta — Technical Report and Recommendations This report is the companion volume to the summary Report and Recommendations published late in 1984, and is the last of our series of publications on the subject of agriculture.

6.5.2 Reports in Preparation in 1985

Provincial Conservation Strategy. A background information brochure entitled *What in the World is a Conservation Strategy?* was released in October. Several

drafts of a prospectus for an Alberta Conservation Strategy were produced for the approximately 200 members of the Council's advisory committees. At the end of the year, the prospectus document was being prepared for public distribution.

Recycling. Five background information bulletins were in various stages of preparation at the end of the year, and a flyer to be used to publicize the hearings had been designed and printed. We expect to release these reports to the public early in 1986.

6.5.3 Reports Reprinted in 1985

Only one report was reprinted in 1985. Two additional print runs of *Maintaining and Expanding the Agricultural Land Base in Alberta: Summary Report and Recommendations* were required to meet demand. Total distribution of this report is approaching 9,000 copies, the widest distribution of any report in the ECA's 15-year history.

6.5.4 Policies and Procedures

In the future, we will be making some changes in our publishing procedure for certain types of reports. In-house, on-demand printing, wherein only as many copies as are ordered are duplicated and bound (stapled) in the ECA office, will become the norm for reports with limited demand, and for most reprints. This procedure was successfully used to produce the early versions of the Conservation Strategy Prospectus in October and November. This change should allow us to present the same information at less cost, and to eliminate excess inventory of reports.

7. APPENDICES

APPENDIX A. ANNUAL REPORTS OF THE PUBLIC ADVISORY COMMITTEES

CO-ORDINATING COMMITTEE

Report from the Chairman – Dr. Shari Dalton

The Co-ordinating Committee of the Public Advisory Committees met monthly during 1985, with the exception of the summer break. We had a very successful year, making major progress toward consolidating our co-ordinating function.

Many of our activities originated in the findings of the October, 1984 Workshop on Effectiveness. It was realized at that workshop that the Public Advisory Committees were moving into a new dynamic stage in their existence, and that a re-definition of our roles was in order. This led to a year of self-examination, discussion, and a critical analysis of our goals and methods of achieving them. One result will be a clarified Roles Document for the Public Advisory Committee on the Environment, the Science Advisory Committee, and the Environmental Education Advisory Committee, including new terms of reference for the six study groups. The Roles Document, to be ready in early 1986, will help focus our activities, thereby increasing efficiency, and will help member organizations in the selection of an appropriate study group. I would particularly like to thank Dr. Lub Wojtiw and Mr. Archie Landals for their help in the rewriting of the portion on the Public Advisory Committee on the Environment.

Dr. Wojtiw, in his role of past chairman and chairman of the Resolutions Committee, has continued the work of Mr. J. Shemanchuk in revising our resolution procedures. We now have an updated resolutions format and submission timetable, with the consulting role of the Science Advisory Committee, the Environmental Education Advisory Committee, and the Environment Council of Alberta researchers, well-defined. This will allow us to produce well-documented, effective resolutions without the last-minute problems that so often arose previously.

The study groups and the Co-ordinating Committee have also recognized the need to do more "follow-through" on our resolutions. To this end, we have this last year gone back over several recent resolutions and analyzed the responses of the recipients to them. In some cases, unfortunately, response was lacking or of an inadequate nature. We, therefore, have made it a function of future past chairmen of the Co-ordinating Committee to co-ordinate this resolutions follow-up, beginning with a review of all past resolutions from the inception of the Public Advisory Committees. Trends will be noted and improvements for the future suggested.

The Public Advisory Committees, again through Dr. Lub Wojtiw, participated in the celebration of Environment Week 1984 and the Youth Conference held in Edmonton. We look forward to such participation on an annual basis in the future. We are very excited about the Environment Awards to be presented by the Minister of the Environment during Environment Week, in the future. Our representatives will be working on the committee setting up these awards and making nominations for them. I would like to thank Dr. Julian Guay and his Environmental Education Advisory Committee for all the work they have done to bring these awards into being.

This past year has seen major upheavals in the federal environment programs. Our concerns over this have led, along with many other events, to our request for the formation of a Government of Alberta caucus committee on the environment. We discussed this with the Minister of the Environment, Mr. Bradley, at our June meeting and have contacted both the former premier, Mr. Lougheed, and more recently, Premier Getty, in this regard. We look forward to a positive response from Mr. Getty, and are continuing our efforts with a Co-ordinating Committee resolution to the 1985 Annual Joint Meeting. This caucus committee is badly needed.

We are hoping that another item discussed with the Environment Minister, Mr. Bradley, will also come to pass, namely, the meeting of the Co-ordinating Committee with Mr. Bradley and one or more other ministers responsible for environmental issues within this province. We have, in the past, had serious problems in meeting with ministers other than the Minister of the Environment and we look forward to Mr. Bradley's assistance, perhaps in setting as many as three or four such joint meetings a year.

These meetings, along with allowing the airing of several past concerns, would provide continued discussion regarding the development of a Provincial Conservation Strategy, the topic of the 1985 Annual Joint Meeting and, I believe, the focal point of much of our activity in the following years. We have made a head start on the development of this Strategy, with the much-appreciated work of the Steering Committee, members of which are listed at the bottom of this report.

I would very much like to thank them all for their work and for setting our directions for the future. I foresee the conservation strategy as being a topic for public hearings, once the recycling hearings, announced last year by Mr. Bradley, are completed.

Finally, I wish to offer special thanks to Mr. Bob Richardson for organizing the Annual Joint Meeting, and to the very capable staff of the Environment Council of Alberta, who helped make this an extremely productive year.

Dr. Sheri Dalton
Chairman, Co-ordinating Committee

Co-ordinating Committee Members

Dr. S. Dalton – Chairman
Mr. R.M. Richardson – Vice-Chairman
Dr. L. Wojtiw – Past Chairman
Mrs. A. Parkinson – Chairman, Energy Study Group
Mrs. D. Broadbent – Chairman, Environment Protection Study Group
Mrs. E.S. Hunter – Chairman, Non-Renewable Resources Study Group
Mr. W. Irwin – Chairman, Pollution Study Group
Dr. P. Woodard – Chairman, Renewable Resources Study Group
Dr. L. Wojtiw – Chairman, Resolutions Committee
Mr. W.A. Flook – Chairman, Urban Environment Study Group
Dr. D. Thompson – Chairman, Science Advisory Committee
Dr. J. Guay – Chairman, Environmental Education Advisory Committee

Members of the Provincial Conservation Strategy Steering Committee

Mr. B. Alleyne – Pollution Study Group
Mrs. D. Broadbent – Chairman, Environment Protection Study Group
Dr. Bill Buchta – Non-Renewable Resources Study Group
Mr. W. Flook – Chairman, Urban Environment Study Group
Dr. John Godfrey – Environmental Education Advisory Committee
Ms. L. Horstman – Science Advisory Committee
Mr. E. Kure – Renewable Resources Study Group
Ms. Betty Paschen – Energy Study Group
Mrs. M. Posey – Renewable Resources Study Group
Mr. R.M. Richardson – Vice-Chairman, Co-ordinating Committee and Member, Environment Protection Study Group
Dr. J. Snyder – Vice-Chairman, Renewable Resources Study Group
Mr. Dan Stoker – Environmental Education Advisory Committee

MEMBERSHIP COMMITTEE

Report from the Chairman – Mr. Archie Landals

The membership roster of the Public Advisory Committees was kept under continuing review during 1985 and revised editions of the membership list were issued in February, May, August, and November.

No official meetings of the Membership Committee were held in the past year, however, a number of matters were settled by telephone conferences be-

tween the chairman and the members on May 6, June 17, June 25, September 13, and October 17.

During the course of the year, seven new associations were added to the growing list of Public Advisory Committee constituents and they supplied members as follows:

Alberta Cancer Board – Mrs. G. Bako
City of Fort Saskatchewan – Alderman D. Petroski
Ducks Unlimited Canada – Mr. G.R. Stewart
Society for the Protection of Architectural Resources in Edmonton (SPARE) – Mr. C. Pickard
Solar Energy Society (Calgary Chapter) – Dr. J.E. Rapson
Western Barley Growers' Association – Mr. S. Wiskel
Wildlife Society of Canada – Ms. R. Usher

An invitation to nominate a member was also issued to the City of Airdrie; to date, no response has been received.

The Alberta Motor Association and the Girl Guides of Canada (Alberta Council) have withdrawn their memberships due to time constraints and availability of members to represent their associations.

The following 26 members resigned their positions on the Public Advisory Committee on the Environment during the past year:

Mr. A. Chanin
Mrs. T.F. Clement
Mr. M. Colledge
Mr. A. Dickson
Mr. P. Dobson
Mr. D. Dube
Mr. G. Dudley
Dr. A. Garbutt
Mr. D.A. Gemmill
Dr. G.C.D. Griffiths
Dr. K.O. Higginbotham
Mrs. L. Klute
Mr. B. Kolenosky
Mr. G. Lane
Mr. K. Langhorn
Mr. T. Lau
Mr. D. Lawrence
Mr. J. Lickacz
Mr. D. Myrehaug
Mr. R. Nielsen
Mr. D.C.D. Parker
Dr. J.B. Railton
Mr. D. Reid
Dr. R. Shaw
Mr. F. Walicki
Mr. C. Walker

To these volunteers we wish to extend our thanks for their service during their term of office and trust that we might be associated with them again at some future date.

Each year a number of members whose terms expire are willing to undertake an additional term of service. We wish to thank the following people for their continuing contribution of their knowledge and judgement for an additional term on the Public Advisory Committee on the Environment:

Mr. G. Cameron
Mr. N. Carlson
Dr. M.H. Chaudhry
Mr. D.K. Elton
Mr. G. Fabris
Mr. J.C. Finlay
Mrs. E. Friesen
Dr. R. Gehrke
Mrs. E.S. Hunter
Ms. J. Lewin
Mrs. D.J. Lewoniuk
Ms. M. Posey
Mr. E.G. Radbourne
Mr. R. Romanetz
Mr. A. Rytz
Dr. R. Scace
Mr. J.A. Shemanchuk
Mrs. J. Sloan
Mr. J.E. Staples
Mrs. M. Stephenson
Mr. G. Stewart
Dr. G. Swinnerton
Dr. L. Wojtiw

New members added to the unaffiliated roster were:

Ms. L. Allison
Mr. A.C. Dunkley
Dr. K. Pennifold
Mr. N.S. White
Dr. J.C. Wood

The remaining two Advisory Committees to the Environment Council of Alberta experienced the following changes in 1985:

Science Advisory Committee:

Prof. P. Dranchuk
Dr. A. Laycock
Dr. E. Prepas
Mr. B. Wishart

resigned their positions on SAC. The SAC added no new members to their ranks in 1985; however, the following nine members accepted reappointment to another three-year term:

Dr. H. Buckmaster
Dr. S. Dalton
Dr. J. Hackler
Ms. L. Horstman
Dr. R.K. Lane
Dr. P. Mahaffy
Dr. R.P. Pharis
Dr. W.H. Vanden Born
Dr. T.S. Veeman

Environmental Education Advisory Committee:

Mr. E. Berndt
Mrs. K. Habberfield

resigned their positions on EEAC. The following eight members were added to EEAC in 1985 :

Dr. L. Bakshi	Mr. L. Johnson
Ms. E. Beaubien	Dr. W. Samiroden
Mr. R. Ebel	Mr. D. Spalding
Dr. J. Godfrey	Mr. D. Stoker

At the end of the year, the roster for the Public Advisory Committee on the Environment, the Science Advisory Committee, and the Environmental Education Advisory Committee was as follows :

- 124 organizations on the Public Advisory Committee on the Environment
- 113 members representing organizations
- 36 alternate members
- 20 unaffiliated members
- 16 Science Advisory Committee members
- 16 Environmental Education Advisory Committee members

This brings the total membership to 201 including alternates, unaffiliates, members of SAC, and members of EEAC.

Mr. Archie G. Landals
Chairman, Membership Committee

Members of the Membership Committee

Mr. A.G. Landals (Chairman) – Director, Liaison, Environment Council of Alberta
Mr. B. Irwin – Pollution Study Group
Dr. P. Woodard – Renewable Resources Study Group

ENVIRONMENTAL EDUCATION ADVISORY COMMITTEE

Report from the Chairman – Dr. Julian Gusy

The Environmental Education Advisory Committee was very active during 1985, with nine regular meetings, plus one sub-committee meeting.

1) In January, the EEAC met at the ERCB Building in Calgary and participated in a guided tour. The most important issue to be dealt with at our January meeting was the need for teacher in-servicing in regard to the Environmental Education Curriculum Guide.

2) In February, the EEAC met at Fort Calgary. Mr. Bruce Elkin, Director of Yamnuska Mountain School of Canmore, was the guest speaker. Mr. Elkin spoke about environmental education leadership.

3) At the March meeting, Dr. Lochan Bakshi presented a detailed outline of the EEAC-sponsored "Wildrose Achievement Awards" for consideration and approval by the Committee.

4) In April, the EEAC met in Edmonton. The guest speaker, Mr. Bob Stevenson, Director, Public Information, Fish and Wildlife Division, Energy and Natural Resources, shared their experiences in the development of the Big Horn Awards.

5) For our May meeting, we travelled to Camp YoWoChAs at Lake Wabamun and toured their facilities. Two guest speakers, Mr. Rod Irwin, Director, YoWoChAs Centre and Mr. Steve Montgomery, Director, Outdoors Alberta, informed us of their respective programs.

6) At the June meeting, two guest speakers, Dr. Wallie Samiroden, University of Alberta and Mr. Rick Mrazek, Alberta Education, spoke on the present and future direction of environmental education in post-secondary education.

7) In July, a sub-committee of the EEAC met to revise our portion of the Roles Document.

8) At the September meeting, Ms. Lisa Casselman, Interpretative Specialist, Parks Canada, was the guest speaker. She spoke on environment education through Parks Canada interpretative services.

9) At the October meeting, an update of communication with the Minister of Environment on the Wildrose Achievement Awards was presented. The Minister suggested the composition of a Selection Committee.

10) At the November meeting, Mike Kelly presented the Provincial Conservation Strategy to the EEAC.

The EEAC offers a very special thanks to Randalin Pretty and Pam MacKechnie for secretarial help.

Dr. Julian Guay
Chairman, Environmental Education Advisory Committee

Members of the Environmental Education Advisory Committee

Dr. J. Gusy – Chairman
Dr. L. Bakshi
Ms. S. Banks
Mr. B. Batycky
Ms. E. Beaubien
Mr. E. Berndt *
Mr. D. Clarke *
Mr. R. Ebel
Dr. L. Fenna
Mrs. J. Finlay
Mrs. C. Gardner
Dr. J. Godfrey
Mrs. K. Habberfield *
Mr. R. Ireland
Mr. L. Johnson
Mr. J. Robertson
Dr. W. Samiroden
Mr. D. Spalding
Mr. D. Stoker

* No longer on EEAC

SCIENCE ADVISORY COMMITTEE

Report from the Chairman – Dr. Dixon Thompson

The Science Advisory Committee met three times in 1985, in keeping with the 1984 decision to increase the work on matters of substance and reduce the number of formal meetings. The January meeting was at the Edmonton headquarters of the Alberta Research Council where the President of ARC, Dr. Stewart, provided a report on the activities of the ARC as they relate to environmental issues. The overview was very helpful in providing a perspective on one Alberta Government agency's capabilities, although there was no tour of laboratory facilities because of time and logistical problems. The September meeting took place at the Alberta Environmental Centre at Vegreville. The Centre is just starting to hit its stride. The descriptions of the research and service programs and the tour of the laboratories were very impressive. With the maturation of the Centre, Albertans can have confidence that the research facilities available are state-of-the-art. The tour of the Alberta Environmental Centre is recommended to PAC and the EEAC.

Three long-standing members of SAC have resigned: Mr. Bill Wishart, Professor Peter Dranchuk, and Dr. Arleigh Laycock. Their contributions over their many

years of service are gratefully acknowledged. Members have been reappointed with thanks, in anticipation of continued contributions to SAC's work.

Two of SAC's sub-committees continued their work during 1985 : the Wildlife Sub-Committee, chaired by Louise Horstman, dealt with six topics: (i) the assessment of the potential for introduction of wildlife diseases through the importation of native species from other areas or via exotic species from abroad, (ii) the assessment of predator control issues, particularly wolves, (iii) the review of government programs which led to needless destruction of habitat, (iv) a review of the draft *Prospectus for an Alberta Conservation Strategy* carried out by Bill Fuller, (v) a review of the Alberta Government's policy on bears done by Steve Herrero, and (vi) a review of the availability of mountain caribou habitat.

The Water Sub-Committee, chaired by Gary Sykes, submitted a brief to the Alberta Water Resources Commission. It had been planned to prepare a more detailed submission for the inquiry on federal water policy (Pearse Commission) as follow-up to the Fall, '84 brief, but there was too little response to the request for input to make the exercise worthwhile. A research project to investigate priorities for water-related environmental research was considered but dropped. The Sub-Committee is examining the issue of assimilative capacity of bodies of water for waste, but Alberta Environment's discussion paper "Assimilative Capacity : Concepts and Utilization" (Shewchuk, Nov. 1, 1985) may fill much of the need for work on that topic.

Bill Vanden Born and Peter Mahaffy prepared material which formed the basis for revision of the Roles Document for those sections affecting SAC.

The Sub-Committee on Radiation in the tar sands has been inactive and efforts to establish sub-committees on forestry and on endangered plants have been unsuccessful.

The Law Reform Commission of Canada has published a revised draft of a manuscript reviewed by SAC in 1984 : *Crimes Against the Environment : Working Paper 44.* SAC has completed reviews of three draft ECA staff reports on recycling. Reviewers who assisted SAC included Dr. A. Badakhshan, Dr. E.A. Wilman, Dr. W.A. Kerr, and Dr. W.A. Ross of the University of Calgary and Dr. T.W. Manning of the University of Alberta.

Like most other groups concerned about environmental issues in Canada, SAC tried repeatedly to contact the Honorable Suzanne Blais-Grenier about the manner in which she cut her department's budget, and for information about the details on the cuts. We met with the same level of success as everyone else : a singularly uninformative form letter. Letters were written to nine Alberta Members of Parliament including Alex Kindy, Calgary East; Paul Gagnon, Calgary North; Bobbie Sparrow, Calgary South; Jim Hawkes, Calgary West; Bill Lesick, Edmonton

East; Honorable Steve Paproski, Edmonton North; Jim Edwards, Edmonton South; David Kilgour, Edmonton Strathcona; and Murray Dorin, Edmonton West, and meetings were held with Members of Parliament Bill Lesick and Jim Hawkes in Ottawa. The efforts of Members of Parliament to get information from the Minister for their own use, or on behalf of others, were only marginally more successful than the initial letters. We look forward to a much more efficient, effective, and communicative federal Department of Environment under the new Minister, the Honorable Tom McMillan.

Once again, SAC would like to invite the Environment Council, the Public Advisory Committee on the Environment, EEAC, and the Minister and his Department to call upon the Science Advisory Committee when they believe we might be of assistance in providing objective scientific advice.

SAC's short-term priority must be expansion and rejuvenation of its membership. A major infusion of "new blood" is needed, not so that there can be more and bigger meetings, but to ensure that SAC has a membership which can play its role effectively.

Dr. Dixon Thompson
Chairman, Science Advisory Committee

Members of the Science Advisory Committee

Dr. D. Thompson (Chairman) – Faculty of Environmental Design, University of Calgary
Dr. C.B. Beaty – Department of Geography, University of Lethbridge
Dr. C.F. Bentley – Department of Soil Science, University of Alberta
Dr. H. Buckmaster – Department of Physics, University of Calgary
Dr. S. Dalton – Concordia College
Prof. P. Dranchuk * – Department of Mineral Engineering, University of Alberta
Ms. L. Duncan – Environmental Law Centre
Dr. W.A. Fuller – Department of Zoology, University of Alberta
Dr. J. Hackler – Department of Sociology, University of Alberta
Ms. L. Horstman – Canadian Society of Environmental Biologists
Dr. R.K. Lane – Environment Canada
Dr. A. Laycock * – Department of Geography, University of Alberta
Dr. P. Mahaffy – Department of Chemistry, King's College
Dr. R. Nursall – Department of Zoology, University of Alberta
Dr. R.P. Pharis – Department of Biology, University of Calgary
Dr. W. Phillips – Department of Rural Economy, University of Alberta
Dr. E. Prepas * – Department of Zoology, University of Alberta
Dr. W.H. Vanden Born – Department of Plant Science, University of Alberta
Dr. T.S. Veeman – Department of Economics, University of Alberta

Mr. W.D. Wishart * – Fish and Wildlife Division, Alberta Energy and Natural Resources

* No longer on SAC

ENERGY STUDY GROUP

Report from the Chairman – Mrs. Anna Parkinson

Members of the Energy Study Group were saddened by the sudden death of Mr. Ian Shaw, the previous chairman of the group, so soon after last year's Annual Joint Meeting. A memorial to him in the form of a collection of books, reports, and articles on environmental matters will be maintained at the Goldeye Youth Camp at Goldeye Lake.

During the year, nine meetings were held by the group. At the first meeting members discussed priorities for topics for the coming year. The subject of energy is extremely broad and it was decided for the coming year at least to narrow the topic to energy conservation. Within the overall framework of energy conservation, seven topics were proposed as worthwhile areas to study. After discussion, the group chose as their first priority to study the feasibility of the use of wind power in Alberta and, as their second topic, the evaluation of the use of alternative fuels.

Information regarding the use of wind power in Alberta was gathered from speakers at five meetings, February through June, and from existing literature. Relevant articles and reports were distributed to members of the study group, who read, summarized, and reported on them. The five speakers represented different aspects of the interest in, and the use of, wind power in Alberta. The first was Jason Edworthy, President of Norwester Energy Systems Ltd., whose firm specializes in providing wind energy services. Mr. Dave Miller, TransAlta Utilities Corporation, presented a paper outlining the experience of TransAlta with regard to interconnections with wind power users and the current regulations governing these interconnections. Mr. Dave Baker of SWERP (Solar and Wind Energy Research Program), a division of the Alberta Research Council (ARC), outlined the previous, current, and future research programs of the ARC with regard to the use of wind energy, the designs of wind turbines, and the monitoring of practical test sites at Lethbridge, the Kananaskis area, and airport locations in Alberta. Ms. Mary-Ellen Jones, a research and development officer with Deltx Windpump Corporation, outlined the different types of windpumps which have been developed recently and are now available, their relationship and adaptability to different wind conditions, and their potential uses not only in Alberta but in export markets. Mr. Ernie Sinnott, a farmer near Pincher Creek who generates enough wind power from a three-phase wind turbine on his farm to service three homes, his farm, and his fertilizer business, explained his operation. His interconnection with TransAlta

Utilities Corporation was the subject of an ERCB hearing in 1983. The financial arrangements decided at that time are still being monitored. Mr. Sinnott is very satisfied with the performance of his equipment and plans to use more of the energy generated by it in his own operation.

As a result of these investigations, the study group submitted the resolution to the Annual Joint Meeting recommending that the current monitoring of wind energy programs be continued in order to encourage local application and the prospective export industry.

The meetings held in September, October, and November dealt with the second topic chosen by the study group – the feasibility of the use of alternative fuels. So far we have considered methanol and biomass. Future meetings will explore the topic more fully.

Mrs. Sheila Abercrombie, one of the study group members, has studied in detail over the last year the practical application of various materials and structures in achieving maximum energy efficiency as window coverings. The results of her research are on view in the Edmonton Energy Conservation Centre on Saskatchewan Drive. Members of PAC would be welcome to visit the Centre to see her results and the other energy-efficient features on display.

During the year 1985, membership of the study group has been maintained. Chris Walker, representing the Alberta Association of the Canadian Institute of Planners, retired and was replaced by John McLaughlin of the same association. Dr. June Rapson joined as a new member representing the Solar Energy Society (Calgary Chapter).

Mrs. Anna Parkinson
Chairman, Energy Study Group

Members of the Energy Study Group

Mrs. A. Parkinson (Chairman) – Community Planning Association of Alberta
Mrs. S. Abercrombie – Unaffiliated
Mr. G. Cameron – Edmonton Chamber of Commerce
Mr. D.A. Clarke – SAIT
Mrs. M. Goodwin – Alberta Women's Institute
Mr. G. Lane * – Mount Royal College, Student's Association
Prof. H. Madill – University of Alberta
Mrs. E. Martin – Outdoors Unlittered
Mr. J. McLaughlin – Alberta Association, Canadian Institute of Planners
Mrs. B. Paschen – Unaffiliated
Dr. J.E. Rapson – Solar Energy Society (Calgary Chapter)
Dr. W.A. Ross – University of Calgary

Mr. J.E. Staples – Association of Professional Engineers, Geologists and Geophysicists of Alberta
Mr. B. Staszenski – Save Tomorrow Oppose Pollution (STOP)
Mr. S.E. Stephansson – Alberta Oil Sands Industry Environmental Association
Mr. C. Walker * – Alberta Association, Canadian Institute of Planners
Mr. N. White – Unaffiliated
Mr. B. Wilson + – Save Tomorrow Oppose Pollution (STOP)

* No longer on Study Group
+ Attended Study Group as Alternate

ENVIRONMENT PROTECTION STUDY GROUP

Report from the Chairman – Mrs. Dorothy Broadbent

Mr. R.M. (Bob) Richardson, the 1984 chairman of this study group, was re-elected for a second term of office in 1985, but he resigned at the January meeting, as he was unable to continue as chairman after becoming vice-chairman of the Public Advisory Committee on the Environment. He was replaced by Dorothy Broadbent, the vice-chairman of the study group, with Gary Fabris subsequently being elected vice-chairman for 1985.

Monthly meetings were held throughout the year, with the exception of July and August. Average attendance was slightly below half of the total membership for each meeting. The news media were represented at every meeting except two.

Major Topics of Monthly Meetings

January – Ecological Reserves

Guest Speakers: Mr. Don Cline, Assistant Deputy Minister and Chairman of Ecological Reserves Advisory Committee; Mr. Cliff Wallace, Director, Alberta Wilderness Association

Response from Study Group

1) Members expressed their satisfaction that finally some progress has been made and that this study group had a part in accomplishing a major achievement for this province.

2) The Chairman commended the Minister of Recreation and Parks for the commitment to establish ecological reserves. He recommended that further steps be taken to inform the public about ecological reserves and that changes

be made in the Wilderness Areas, Ecological Reserves and Natural Areas Act to remove present ambiguities and therefore facilitate the nomination and subsequent establishment of an ecological reserves system in this province.

February – Revised Eastern Slopes Policy and Sale of Crown Lands

Guest Speakers : Mr. Fred McDougall, Deputy Minister, Renewable Resources; Mr. Les Cooke, Energy and Natural Resources.

Response from Study Group

1) Concern was voiced over the lack of public input in the formation of the revised policy. It was pointed out that this differed from the precedent set when the 1977 Eastern Slopes Policy was developed using ECA recommendations, compiled after widespread public hearings, as a guideline. The sale of public land was considered contrary to the wishes of the public in the 1974 ECA Report and Recommendations.

2) The members were troubled by the flexibility of the new policy, which was interpreted to mean a liberalization of two activities which would be permitted in certain zones. It was feared this could compromise the wildlife resources in some instances.

3) It was decided to study some of the Integrated Management Plans in detail, in order to better understand the effects of the new Eastern Slopes Policy on the planning process.

March – Integrated Management Plan – Nordegg–Red Deer River

Guest Speaker : Mr. Dave Belyea, Planner, Resource Planning Branch, Energy and Natural Resources

Response from Study Group

A detailed response was submitted to the planning team and the Associate Minister of Public Lands and Wildlife was informed of the study group's opinions in regard to the revised Eastern Slopes Policy.

April – ECA's Report and Recommendations on Maintaining and Expanding the Agricultural Land Base in Alberta

Guest Speaker: Mr. George Walker, Member, Agriculture Panel

Response from Study Group

The group decided to concentrate their energies on promoting wetlands, wildlife habitat, recreational facilities, and related areas within the context of maintaining or expanding the agricultural land base.

May – Provincial Conservation Strategy

Guest Speaker : Mike Kelly, ECA Research Officer

Response from Study Group

Members agreed to co-operate with this project by appointing representatives to the Ad Hoc Committee and by informing their sponsoring organizations about the proposed Provincial Conservation Strategy.

June – A guest speaker was not available for this meeting.

September – Wetlands in Alberta

Guest Speakers: Mr. Ken Ambrock, Fish and Wildlife Division, Energy and Natural Resources; Mr. Ron Russell, Ducks Unlimited

Response from Study Group

This joint undertaking between the Department of Energy and Natural Resources and Ducks Unlimited was viewed as a very worthwhile undertaking, which promises to significantly improve wetland habitat in specific areas of this province. However, members were concerned over other wetlands receiving no protection, and presently in danger of being drained for agricultural purposes.

October – "Wetlands Inventory Program"

Guest Speakers : Mr. R.H. Cronkhite, Executive Director, Water Resources Commission; Mr. Bruce McLock, Alberta Environment.

Response from Study Group

The environmental implications of drainage projects were considered extremely important, especially in the settled regions of the province. Members questioned the need for further drainage of our remaining wetlands, many of which are vital habitat areas for aquatic wildlife species.

Topics of Concern to Environment Protection Study Group During 1985

1) Kimiwan Lake – Attempts were made to assist the residents of the town of McLennan in solving the problems causing the deterioration of Kimiwan Lake.

2) Four Mountain Parks Planning Process – Meetings were monitored by individual study group members.

3) Status of Fish and Wildlife Resources in Alberta – This positive document was supported by the study group.

4) Environmental Impact Assessment of the Three Rivers Dam – The chairman corresponded with the Minister of the Environment over this issue.

5) Nahanni National Park – Individual members attended public hearings sponsored by Parks Canada.

6) Westcastle Development – The chairman communicated the group's concerns over the sale of public land to the Associate Minister of Public Lands and Wildlife.

7) Grazing and Access on Public Land – This is a complicated issue and no decisive action has yet been taken.

8) Senate Report – *Soils at Risk* – The group is currently gathering information on this topic.

9) Southcastle IMP – Action is presently being contemplated, as members are disturbed over the effects the changes in zoning will have on grizzly bear populations and other significant features of this important area.

10) Expansion of the town of Elkwater – This is a recent issue which has not been studied sufficiently to determine whether or not action is necessary.

11) Sale of Public Land for Agriculture – Action is presently being taken over this serious development.

Resolutions Sponsored by the Group During 1985

1) Wetlands – As a result of several meetings devoted to wetland issues, a resolution promoting the conservation of wetland habitat has developed.

2) The Five Forest Land Use Zones – This resolution supports the restriction of motorized access presently in effect in specific areas in the Eastern Slopes.

Future Direction

Wetlands Habitat has been chosen as a major topic for 1986. Our research has revealed that little importance is placed on preserving wetland habitat in this province, and there is a lack of understanding of the role of wetlands. Consequently, this study group intends to continue to gather information in order that it may assist the appropriate agencies to understand and accept the need for a program of conservation of all types of wetlands in Alberta.

Conclusion

This study group has concluded a busy year, which has been informative and challenging. The conscientious members who have regularly attended meetings have enabled this group to be an informed and effective part of the Public Advisory Committees. We have been assisted by the efficient staff members of the Environment Council, who have been helpful and reliable throughout the year.

Mrs. Dorothy Broadbent
Chairman, Environment Protection Study Group

Members of the Environment Protection Study Group

Mrs. D. Broadbent (Chairman) – Unaffiliated
Mrs. L. Allison – Unaffiliated
Mrs. M. Bailey – Southern Alberta Environmental Group
Mr. C. Blackburn, Jr. – Foothills Protective Association
Dr. R. Cairns – Alberta Institute of Agrologists
Mr. A. Chanin * – Calgary Chamber of Commerce
Mrs. T.F. Clement * – Girl Guides of Canada
Mr. G. Fabris – Red Deer College
Mr. H. Fauser – Alberta Fish and Game Association
Mrs. L. Feltham – Health Unit Association of Alberta
Dr. R. Gehrke – Alberta Chiropractic Association
Mr. A. James – Calgary Chamber of Commerce
Mr. E. Jarvis – Western Stock Growers' Association
Mr. D. Kariel + – Sierra Club of Alberta
Mrs. P. Kariel – Sierra Club of Alberta
Mr. B. Kolenosky * – Northern Alberta Association of Biological Science Technicians
Mrs. J. Krabbe – Citizens for Public Justice
Mr. R.P. McKenzie – Alberta Beekeepers' Association

Dr. M. Muc – City of Camrose
Mr. R.E. Nielsen* – Alberta Federation of Labour
Mr. D. Reid * – Canadian Society of Environmental Biologists
Mr. R. Richardson – Unaffiliated
Mrs. R. Robinson – YWCA
Mrs. K. Russell – Women of Unifarm
Dr. R. Scace – Unaffiliated
Mr. P. Seymour – University of Alberta
Mr. S. Shwetz – Alberta Association of Municipal Districts and Counties
Mr. G.R. Stewart – Ducks Unlimited Canada
Dr. G. Swinnerton – National/Provincial Parks Association of Canada (Edmonton Chapter)
Ms. R. Usher – Canadian Society of Environmental Biologists and Wildlife Society of Canada

* No longer on Study Group
\+ Attended Study Group as Alternate

NON-RENEWABLE RESOURCES STUDY GROUP

Report from the Chairman – Mrs. Betty Hunter

We dealt with a variety of topics this year – some "exploratory," others a suitable culmination of a concern.

The use of mediation to solve environment concerns or problems – a useful tool that may be a necessary one in the future.

One outstanding fact resulting from two programs on heavy oil development was the apparent good public relations and excellent job of communications with concerned citizens and the companies. Their reclamation plans were excellent, if implemented.

Our group had presented a brief to the Agriculture Land Use Hearings and were glad to hear from a panel member and have a discussion with him.

Interested always in reclamation re: "gravel pits," coal mines, oil drilling, etc., we heard from the chairman of the Land Conservation and Reclamation Council and were able to get answers to our many queries.

Recently, at an annual conference, we sponsored and had passed a resolution on the recycling of used lube oil. We feel we can take credit for the program Oil Drop instituted by the provincial government. We have written to all service clubs

and other groups, congratulating them on their sponsorship of "drives" to call public attention to Oil Drop programs in their areas. We are happy to announce a success story. More public awareness is necessary.

The following topics have been considered and will likely require further study :

1) The question of oil rights in the case of individuals drilling water wells with resultant natural gas content.

2) Two study groups and ourselves are interested in undeveloped road allowances.

3) Natural gas as a fuel – a field trip to the Northern Alberta Institute of Technology for presentation and demonstration of a vehicle fueled by natural gas. This too is a subject that may require further study.

Mrs. Betty Hunter
Chairman, Non-Renewable Resources Study Group

Members of the Non-Renewable Resources Study Group

Mrs. E.S. Hunter (Chairman) – Consumers Association of Canada
Mr. D. Broughton – Unaffiliated
Dr. W. Buchta – NAIT
Mr. G. Cameron – Edmonton Chamber of Commerce
Mr. A. Dickson * – United Grain Growers' Limited
Mr. G.T. Dudley * – Alberta Irrigation Projects Association
Mr. A.C. Dunkley – Unaffiliated
Mr. H. Fauser * – Alberta Fish and Game Association
Mr. J. Hirsch – City of Medicine Hat
Mr. R. Jensen – Alberta Irrigation Projects Association
Mr. A. Kennedy – Coal Association of Canada
Dr. A. Lamb – Alberta Chamber of Commerce
Mrs. S. Nelson Pier – Calgary Local Council of Women
Mr. D.C.D. Parker * – Coal Association of Canada
Mr. G.F. Paschen – Archaeological Society of Alberta
Mr. J. Prostebby – Electric Utility Planning Council
Dr. J. Railton * – Coal Association of Canada
Mrs. M. Stephenson – Alberta School Trustees Association
Mr. G. Stewart – Canadian Petroleum Association
Mr. A. Willier – Native Outreach

* No longer on Study Group

POLLUTION STUDY GROUP

Report from the Chairman – Mr. W.C. (Bill) Irwin

Throughout the year, the Pollution Study Group continued to actively study a number of issues, including the following:

a) hazardous waste disposal
b) oil sand emission technology
c) chemical applications in forests
d) indoor air quality
e) the acid deposition research program
f) grasshopper spraying
g) waste quality.

The study group continues to monitor the progress of the implementation of the hazardous waste management program. We are pleased with progress in a number of areas, but are still concerned with the provision for on-site storage and disposal by industries generating hazardous waste. Monitoring of storage, transportation, and disposal is still a concern.

Chemical application in forests is still a concern to the study group. Although proposed acreages are small at this time, we are concerned with the precedent for future widespread spraying and the associated environmental effects.

Indoor air quality is an emerging environmental health problem that will attract increasing attention in the coming years. The study group will continue to follow this issue.

The study group is pleased with government's decision to undertake a major Acid Deposition Research Program. This integrated, objective research is long overdue in Alberta. We look forward to the results and will continue to actively monitor this program.

The Pollution Study Group was very alarmed with the massive and apparently indiscriminate spraying for grasshoppers, with no monitoring programs in place.

On the positive side, we were pleased to see the strong public outcry and the eventual agreement of both the federal and provincial governments to initiate monitoring programs with future spraying. The Pollution Study Group will actively follow this most serious environmental issue.

A water quality workshop was held at our May meeting, which was attended by provincial and municipal officials, as well as others representing industry and the general public.

The three major issues identified were:

1) The need to look at the Government of Alberta's water policy.

2) The need to look at the Government of Alberta's standards for water quality and water management concerns.

3) The need to look at recycling, waste management, and enforcement.

The Pollution Study Group has agreed to address the issue of water quality policy as the major study item.

We were pleased with the positive public response to our water quality workshop. The agreement between the Province and the City of Edmonton to undertake a major study of the city's water supply is encouraging. Hopefully, this study will result in new and better standards that will ensure that Edmonton's water is not only safe, but also drinkable.

I would like to express our appreciation for all the assistance of the ECA staff, in particular, Randy Pretty, Archie Landals, Ken Nelson, and Pam MacKechnie, as well as to Lub Wojtiw and Brian Alleyne, who organized the Water Quality Workshop on behalf of the members of the group.

Mr. W.C. (Bill) Irwin
Chairman, Pollution Study Group

Members of the Pollution Study Group

Mr. W.C. Irwin (Chairman) – Canadian Institute of Public Health Inspectors (Alberta Branch)
Mr. B. Alleyne – Alberta Public Health Association
Mrs. G. Bako – Alberta Cancer Board
Mr. E.R. Brushett – Energy Resources Conservation Board
Mr. N. Carlson – City of Wetaskiwin
Dr. M.H. Chaudhry – Lakeland College – Vermilion Campus
Dr. K. Cummins – Mount Royal College
Mr. J. Dilay + – Energy Resources Conservation Board
Dr. R.J. Fessenden – Alberta Research Council
Mr. D.B. Fraser – City of St. Albert
Mr. D.A. Gemmill * – Chemical Institute of Canada – Canadian Society for Chemical Engineers (Calgary Section)
Dr. G.C.D. Griffiths * – Unaffiliated
Dr. C. Hankins – Alberta Medical Association
Ms. J. Hedenstrom – Unaffiliated
Dr. M. Hussain – Weed Control Research Society of Alberta

Dr. M. Kostuch – Unaffiliated
Mr. T. Lau * – Strathcona Industrial Association
Mrs. D.J. Lewoniuk – Alberta Lung Association
Mr. R. Lutz – Fort Saskatchewan Regional Industrial Association
Mr. I.S. Macdonald – Strathcona Industrial Association
Mr. G. Merrick – Alberta Fish and Game Association
Dr. A. Pipe + – Lakeland College – Vermilion Campus
Dr. P. Ramalingam – Canadian Union College
Mr. R. Romanetz – City of Drumheller
Mrs. J. Roschlaub – Alberta Pharmaceutical Association
Mr. W.K. Ross – Unaffiliated
Mrs. L. Scraba – Unaffiliated
Dr. R.K. Shaw * – Medicine Hat College
Mr. J.A. Shemanchuk – Entomological Society of Alberta
Mr. A. Theobald – Alberta Federation of Labour
Mr. D.R. Thomas – Law Society of Alberta
Dr. L. Wojtiw – Canadian Meteorological and Oceanographic Society

* No longer on Study Group
+ Attended Study Group as Alternate

RENEWABLE RESOURCES STUDY GROUP

Report from the Chairman – Dr. Paul M. Woodard

On 18 January, Drs. Paul M. Woodard and Joan Snyder were installed as Chairman and Vice-Chairman, respectively, of the Renewable Resources Study Group. In addition, Mr. Gary Sykes, another study group member, was seconded to the Science Advisory Committee with responsibility to chair a sub-committee on water.

Throughout the year, the members of the Renewable Resources Study Group took an active interest in the following issues:

a) Eastern Slopes Policy
b) South Saskatchewan River Basin Hearings
c) Abandoned Railway Rights-of-Way
d) Bill 84 – Wildlife Act
e) Highwood River Diversion
f) Agriculture Hearings
g) The Sale of Crown Lands
h) Cold Lake – Beaver River Water Management

We devoted a great amount of energy to trying to change governmental perspectives and policies. A number of letters were written to the Honorable Don

Sparrow, as well as other cabinet ministers. Twice we solicited assistance from Premier Lougheed.

During the January 18 meeting, Mr. Mike Kelly, an ECA Research Officer, introduced the members of the study group to the concepts of the World Conservation Strategy. Mr. Elmer Kure moved: "...this study group agreed to serve as the catalyst for the development of a Provincial Conservation Strategy...." The motion was seconded and passed. Dr. Joan Snyder and Mr. Elmer Kure volunteered to assist Mr. Kelly in developing the required documents.

During the March 15 meeting, Dr. David A. Munro, a consultant to the World Conservation Strategy, spoke to us. His message provided the inspiration the group needed to carry on with a task that seemed impossible to finish. At the time of this report, this study group has produced a number of press releases, a draft prospectus for an Alberta Conservation Strategy (ACS), and has convinced the Public Advisory Committees to adopt the Provincial Conservation Strategy as the theme of the 1985 Annual Joint Meeting.

At our 17 May meeting, Mr. Charles Stewart, an Agriculture Hearing Panel Member, discussed the ECA Report and Recommendations on Maintaining and Expanding the Agricultural Land Base in Alberta with our group. In general, I think the study group would agree the discussion was most enlightening and the panel recommendations recognized in principle those issues raised in our group's brief at the hearings.

The study group followed with interest the development of the water management plan for the Cold Lake–Beaver River area. We were pleased to see the final decision to pipeline water from the North Saskatchewan River to be used for injection to recover heavy oil. The commitment to recycling is also important to safeguarding the area's environment. We feel that this is an excellent example of integrating industrial and environmental concerns that can only be achieved through honest public consultation.

In closing, thanks are due to all study group members who actively participated throughout the year. Their enthusiasm, hard work, and creditable counsel contributed immeasurably to the success of this group during 1985. In addition, special thanks should be extended to Randy Pretty, our Secretary; Archie Landals, Counsellor and Aide; Ken Nelson, Information Services; and Mike Kelly and Kim Sanderson, ACS "work horses." These ECA staff folks made our jobs easier and far more rewarding.

Dr. Paul M. Woodard
Chairman, Renewable Resources Study Group

Members of the Renewable Resources Study Group

Dr. P.M. Woodard (Chairman) – Canadian Institute of Forestry
Mr. D. Appleby – Cold Lake Community Advisory Committee
Dr. J.S. Campbell – University of Lethbridge
Mr. P. Dobson * – Alberta Wheat Pool
Mr. D. Dube * – Unaffiliated
Mr. J. Eisenhauer – Alberta Wilderness Association
Dr. D.K. Elton – Canada West Foundation
Mr. C. Fawcett – United Farmers of Alberta Co-operative Limited
Mrs. E. Friesen – Unifarm
Mr. A. Garbutt * – Canadian Society of Environmental Biologists
Mr. H. Gardner – Federation of Alberta Naturalists
Mr. T. Garner – Fairview College
Dr. A.F. Gerrow – Alberta Veterinary Medical Association
Mrs. S. Henderson – Alberta Association of Registered Nurses
Mr. R.A. Hill – Olds College
Mr. E. Kure – Unaffiliated
Mr. K. Langhorn * – University of Alberta, Students' Union
Mr. J. Lickacz * – Fairview College
Mr. S. Linington – Northwestern Fishing Co-op
Mr. B. MacDonald – Grande Prairie Chamber of Commerce
Mr. B. Meller – Lethbridge Community College
Mr. H.R. Patching – Alberta Wheat Pool
Ms. M. Posey – Canadian Nature Federation
Mr. A. Rytz – Alberta Forest Products Association
Dr. J. Snyder – Grande Prairie Regional College
Mr. G. Sykes – Canadian Water Resources Association (Alberta Chapter)
Mr. R. Whistance-Smith – Unaffiliated
Mr. A. Wierenga – Christian Farmers Federation
Dr. C. Wood * – Unaffiliated
Mr. J. Wooders – Alberta Trappers' Central Association

* No longer on Study Group

URBAN ENVIRONMENT STUDY GROUP

Report from the Chairman – Mr. W.A. Flook

During 1985, the Urban Environment Study Group suffered the loss of two valued members, former chairman Dr. Lochan Bakshi and Dr. Ridley Shaw. Despite this, the vigor and enthusiasm of the group continued and by the end of the year, the total membership had increased from 18 to 22.

Nine meetings were held, with over half of the membership present for all but one of them. At all of these meetings, participation of members was lively and constructive. The chairman wishes in particular to compliment our new members for their prompt and ready involvement in the business of the meetings.

As an ex-officio member of the Co-ordinating Committee, the chairman attended and reported back to the group on all but one of the Committee's regular meetings, including one with the Minister of the Environment. He also acted as a member of the Annual Meeting Organizing Committee, and participated as a group leader at the water quality workshop held by the Pollution Study Group in the month of May.

As the year commenced, the interest in noise abatement, which had been demonstrated during the previous year, was maintained. Late in 1984, a letter had been sent to the Minister of the Environment expressing disappointment with his lack of positive response to the ECA's Report and Recommendations of July, 1982, as well as the Public Advisory Committees' resolution, No. VIII of December, 1983. In acknowledging the Minister's appointment of an interdepartmental committee to review the ECA's report, the group wondered why this had not been better publicized. Attempts were made to find out from the Minister who the chairman of the committee was and what were his terms of reference.

These attempts failed, however, and by the end of the year, in spite of a meeting with Mr. Al Schulz of the Department of Environment's Air Quality Branch, the group was unable to establish contact with the committee to obtain any assurance that the principal recommendations of the ECA's report were receiving favorable consideration. It seems a pity that the importance attached to the problems of noise by the World Health Organization and by its own Environment Council does not appear to be shared by our present provincial government.

With the able advice and guidance of Mr. Keith Driver, the group was, at this time, also involved in a review of changes to the Alberta Planning Act. This resulted in a recommendation to the Minister of Municipal Affairs for clarification of the use of the term "Public Utility" within the Act in order to avoid confusion. This recommendation received grateful acknowledgement from the Minister through his Deputy Minister, Mr. A.R. Grover.

At this time too, the chairman was elected by the group to represent them on the Provincial Conservation Strategy Steering Committee and took part in developing the draft prospectus. On behalf of the group, he was able to gain acceptance for the inclusion of an objective aimed specifically at the conservation of the urban environment. This has now been included in the final draft of the prospectus for presentation to the membership of the Public Advisory Committees at large, at the Annual Joint Meeting in December, 1985.

Also early in the year, the group's attention was directed to the increasing problems of public resistance to the sites proposed for Edmonton's future garbage disposal operations. After some consideration, it was concluded that the whole business of municipal garbage disposal or "Waste Management" as it is currently designated, should be carefully reviewed and alternatives examined for suggested future use.

The public's views were explored at a meeting of the group with Messrs. Anthony Holinsky and Joe Filewych of the Northeast Edmonton Citizens' Committee, who were resisting the location of a new landfill site in their neighborhood. This was followed by a meeting with Alderman Ed Ewasiuk, who reviewed the problems being encountered by the City of Edmonton and the alternative solutions being considered. The group also heard from Ms. Charlene Currie and Reid Lillico of the Red Deer Regional Planning Commission on their Regional Solid Waste Management Plan.

Later at separate meetings, Messrs. Joe Kostler and Tom Rogers of Alberta Environment's Waste Management Branch, and Mr. Terry Montgomery of Calgary's Sanitation Department, outlined their individual approaches to municipal waste management in Alberta.

An inescapable conclusion was that in Alberta generally, there is now and would probably continue to be heavy dependence on "landfill" as a means of disposal for communal wastes.

An extensive review of current literature on the topic, however, indicates that in many places, both in Canada and the U.S.A. as well as other countries, innovative new measures are being adopted. The group feels that these should be given more careful consideration by Alberta authorities for use here.

As a result of these studies and deliberations, the group considers it a prerequisite that communal "garbage" cease to be regarded as a burden to be "disposed of" and become recognized for the valuable resource it represents. It is further considered that this value is masked and downgraded by the indiscriminate intermixing of the various classes of waste for disposal. An obvious first step would therefore be the avoidance of such intermingling at the household level. This is already being practiced successfully, by "separation at source" in many places, the City of Kitchener, Ontario being a good example for the rest of Canada.

These points were made by the chairman and Mr. Kenn Blom in a presentation to the provincial Regional Sanitary Landfill Task Force and received written acknowledgement from its chairman, Mr. Alan Hyland, MLA.

As a culmination to its year's study of this problem, the group will present, at the Annual Joint Meeting, a resolution aimed at the adoption of separation at source in Alberta municipalities.

We feel that the time has come to regard this process as one of "Materials Recovery" rather than "Garbage Disposal," and would like to invite our colleagues on the Public Advisory Committees to adopt the slogan "Mat-Rec" as a buzz-word to popularize the idea.

In closing, I wish to thank not only the members of the group in whose association the year passed all too quickly, but also those very willing members of the Liaison, Research, and Administrative staffs of the ECA without whose backing and assistance this group certainly could not function.

Mr. W.A. (Bill) Flook
Chairman, Urban Environment Study Group

Members of the Urban Environment Study Group

Mr. W.A. Flook (Chairman) – Unaffiliated
Mr. K. Blom – Unaffiliated
Mrs. P. Campbell + – University Womens' Club of Edmonton (Canadian Federation)
Mr. K. Carson – Alberta Association of Landscape Architects
Mr. M.J. Colledge * – Alberta Motor Association
Dr. S. Dalton – Concordia College
Mr. K. Driver – Unaffiliated
Mr. J.C. Finlay – Council of Alberta Rural Ratepayers' Association
Dr. K. Higginbotham * – City of Edmonton
Mr. A.M. Holland – Alberta Association of Architects
Dr. D.E. King – Urban Development Institute of Alberta
Dr. D. Kvill – Athabasca University
Ms. J. Lewin – City of Calgary
Mrs. M. Lutz – Consumers Association of Canada
Ms. L. Miller – Alberta Motion Picture Industries Association
Mr. D.M. Myrehaug * – City of Camrose
Dr. K. Pennifold – Unaffiliated
Mr. C. Pickard – Society for the Preservation of Architectural Resources in Edmonton (SPARE)
Mr. L. Pimm – City of Red Deer
Mr. E. Radbourne – City of Grande Prairie
Alderman C. Reid – Alberta Urban Municipalities Association
Mrs. P. Reschenthaler – University Womens' Club of Edmonton (Canadian Federation)
Mr. P. Rudiak – Keyano College
Dr. R.K. Shaw * – Medicine Hat College
Mrs. J. Sloan – City of Lloydminster
Dr. C. Wood – Unaffiliated
Mrs. R. Wood + – Consumers Association of Canada

* No longer on Study Group
\+ Attended Study Group as Alternate

APPENDIX B. 1985 RESOLUTIONS

RESOLUTION 1

I. **Caucus Committee on the Environment**

II. **Be It Resolved:**

THAT the Government of Alberta form a Caucus Committee on the Environment.

III. **Background:**

Caucus standing committees of government Members of the Legislative Assembly have proven their usefulness as a bridge between public and government. Members of these committees deal with many topics, and have input from, and are themselves, people with different geographical, professional, and economic backgrounds.

They meet with concerned public groups in an informal but informed way; thus there is less confrontation which tends to encourage positive, intelligent discussion.

Although government Members must be aware at all times of the business of the province, they also represent the many interests of the electorate, and must often strive to achieve compromise when conducting that business. A Caucus Committee on the Environment would, we believe, provide the Members an additional, useful means of communication with the public on people's environmental concerns. The availability of such information can be immensely helpful in the work of establishing workable consensus and compromise on environmental issues.

Caucus committees were formed to serve the particular interests of the public by acting as a link between electors and legislators. In this way a caucus committee supplements the information available to the Minister, and eventually to the Cabinet. Issues concerning growth and development (the practical) often compete economically with environmental concerns (the esthetic). The quality and completeness of the information base available at the time of decision on such issues can determine the balance point arrived at between these concerns.

During this period when Alberta's economy is beginning another upswing we must not forget that the environment is, in essence, a non-renewable resource. Since the existing caucus standing committees deal with the separate areas of

education, agriculture, utilities, health and social services, and economic affairs, important environmental issues tend to be either fragmented among these committees or lost in the shuffle between them. For this, and all the other reasons presented here, we request the formation of one more formal, and vitally important, standing committee: the Caucus Committee on the Environment.

IV. **To Be Directed To:**

The Premier
The Minister of the Environment
The Whip of the Government Caucus

V. **Proposed by the Co-ordinating Committee**

RESOLUTION 2

I. **Wind Energy**

II. **Be It Resolved:**

THAT the Government of Alberta provide further support for the developing wind energy industry through the continuance of research and development and by encouraging on-site demonstrations of this developing technology.

III. **Background:**

Examination of wind power by the Energy Study Group has revealed a small but developing economic activity. There are manufacturers and distributors of windmills in this province who are trying to take advantage of the availability of this renewable and environmentally appropriate form of energy.

The potential for using wind energy is greatest in the southern parts of the prairie provinces, especially southwestern Alberta. Windmills can be used to provide electricity either as a stand-alone facility or tied into the provincial electrical grid. They can also be used for water pumping for irrigation, draining fields for agricultural purposes, or for pumped hydro-storage. These uses are applicable not only in Alberta but also in other prairie provinces, and in other countries.

The economic viability of wind power for large-scale electric generation in Alberta is uncertain at the present time. However, there are specific circumstances where wind power for electrical production may be suitable. Some remote sites where connection to the electrical grid is expensive are viable.

Also, the ability to take advantage of special tax treatments will, if they are big enough, reduce the cost of wind electricity to the point where it will be attractive to some. Careful monitoring of windmills connected into the electrical grid is now proceeding, and within a few years much more will be known about the economics of electricity from wind in this province.

The economic viability of windmills for water pumping shows more promise. Already some small units used for agricultural drainage are being purchased commercially, and are economically attractive today. Large-scale units are being developed, tested, and examined for their viability in Alberta and elsewhere. Alberta at this time is a leader in the development of modern windmills for water pumping applications.

Energy from wind will play a greater role in the future. We feel that Alberta should continue to play a major role in this development, because the world-wide opportunity this technology offers for diversification of the Alberta economy is an important consideration, and because the application of this technology here could become an important part of our energy and agriculture sectors if and when the costs of conventional energy sources rise.

Specifically, we feel that continued support should be provided for the work on water pumping units being undertaken in Lethbridge by the Alberta Research Council, Alberta Agriculture, and others. The next phase of this work should be directed to improving the quality of windmills for water pumping so they can more efficiently, and thus more economically, carry out their tasks. Additionally, there is an acute requirement, for the immediate future, of practical on-farm demonstrations of this technology. Such demonstrations should be undertaken in suitable areas, especially in current or proposed drainage projects. This would promote, in areas where the use of this technology is already feasible, Alberta-designed and built hardware through real-world experience.

We feel the potential use on an international scale of windmills for water pumping is great enough to justify much greater support by the Province at this critical juncture for this newly developing part of Alberta's energy sector. Alberta truly is the "energy province," and the development of wind power should be considered as a worthy addition to its true potential.

IV. References :

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Hawrelak, J., T. Rachuk, and J. Barlishen. 1976. *Wind Power in Alberta.* Information Series 70. Alberta Research Council and Alberta Environment. Edmonton. 79 pages.

Wind-Powered Electric Generator of A.E. Sinnott near Pincher Creek. 1984. Decision D 84-12. Energy Resources Conservation Board. Calgary.

Luft, H.B. and D.M. Cousins. 1984. "Wind Energy Developments in Alberta." 7 pages. Available from Alberta Department of Education Library or Environment Council Library.

V. **To Be Directed To:**

Minister of Economic Development
Minister of the Environment
Minister of Energy and Natural Resources
Minister of Agriculture

VI. **Proposed by the Energy Study Group**

RESOLUTION 3

I. **The Five Forest Land Use Zones**

II. **Be It Resolved:**

THAT the five Forest Land Use Zones be made permanent.

III. **Background:**

In June, 1985 five "Forest Land Use Zones" were designated in the Eastern Slopes. These Zones, known as Wild Kakwa, Job Lake, Blackstone-Wapiti, Upper Clearwater River, and Panther Corners, were designated with a November, 1986 "sunset" clause to permit time for public reaction.

The designation of the Five Forest Land Use Zones is a positive step forward in solving the problems associated with motorized abuse occurring in sensitive Zone 1 and 2 lands in the Eastern Slopes of Alberta. Invoking the present "sunset" clause in November, 1986 may permit motorized access to areas suffering from decades of abuse by ATVs. We strongly support the permanent designation of these five areas, as well as other sensitive areas such as Cardinal Divide.

IV. To Be Directed To :

The Premier
The Minister of the Environment
The Associate Minister of Public Lands and Wildlife

V. Proposed by the Environment Protection Study Group

RESOLUTION 4

I. The Need for a Comprehensive Wetland Management Policy in Alberta

II. Be It Resolved :

THAT the Government of Alberta develop and implement comprehensive policies for the management of wetlands, to ensure that both the quantity and diversity of wetlands are sustained.

III. Background :

After decades of wetland drainage, significant losses have occurred in Canada, particularly in Alberta (Brace 1984). Schick (1972) estimated that in the aspen parklands of Alberta, a 61 percent net loss of wetland area has occurred between 1900 and 1970. Wetlands have many values. They are important in hydrological and biogeochemical cycles. They provide productive and diverse habitats, and are of scientific and cultural value (Shay 1982). There are more than 10 provincial and federal government departments with an interest in wetlands in Alberta, as well as private organizations (Ducks Unlimited, Wildlife Habitat Canada) and interest groups, including farmers, trappers, natives, and recreational groups. Unfortunately, the objectives of the different provincial and federal agencies often conflict. Some agencies are committed to conserving wetlands, while others distribute funds for clearing and drainage. This is evident in Alberta. Of the four government agencies with direct involvement in wetland management, Alberta Fish and Wildlife, Alberta Agriculture, Alberta Transportation, and Alberta Recreation and Parks, none has a stated wetland management policy, yet Alberta Agriculture has two funds for drainage. The public recognizes that not all wetlands need to be preserved, but that we need a comprehensive wetland management policy in which goals and objectives are clearly stated at both the provincial and municipal levels.

IV References :

Brace, R.K. 1984. Title unknown. Paper presented at the Third Annual Western Provincial Conference on Rationalization of Water and Soil Research and Management. Winnipeg. 1984.

Schick, C.D. 1972. *A Documentation and Analysis of Wetland Drainage in the Alberta Parkland.* Unpublished report of the Western and Northern Region. Canadian Wildlife Service. 15 pages.

Shay, J. 1982. "Wetland protection in the 80's." In *Ontario Wetlands Conference Proceedings,* pages 19-25. Federation of Ontario Naturalists, eds. Don Mills, Ontario. 193 pages.

V. To Be Directed To:

The Premier
The Minister of Agriculture
The Associate Minister of Public Lands and Wildlife
The Minister of the Environment
The Minister of Recreation and Parks
The Minister of Transportation
The Minister of Tourism and Small Business

VI. Proposed by the Environment Protection Study Group

VII. Appendix of Supporting Material:

The following material has been prepared in support of the Environment Protection Study Group's resolution on the need for a comprehensive wetland management policy in Alberta. We have grouped our reasons into six categories as discussed below.

A. WETLAND VALUES

Wetlands have many values. These can be grouped into three broad categories, using the example of Shay (1982), as follows:

1. Importance in hydrological and biogeochemical cycles

a) Wetlands are focal points for runoff, recharge, and discharge of water and are important in providing natural flood control, as well as contributing to flow stabilization in rivers and streams.

b) Wetlands reduce the erosive effects of floods, trap silt, moderate salinity, and generally enhance the water regime.

c) Wetlands act as water purifiers, removing chemical and agricultural wastes through filtration, sedimentation, anaerobic decomposition, and biological assimilation.

2. Productivity and habitat diversity

a) Wetlands provide habitat for a wide variety of plants and animals and are highly productive, supporting complex food chains. The biotic density and diversity of wetlands is frequently much greater than in the adjacent uplands. Whitaker (1970) estimated the net primary productivity of marshes and swamps as 2,000 g/m^2 of dry weight annually, whereas boreal forest, the next most productive habitat, produced 800 g/m^2 annually.

b) For many vertebrate species, wetlands provide food, breeding sites, resting areas, nesting materials or sites, moulting grounds, and protection from weather and predators. They also support large and diverse communities of invertebrates.

c) The fish, furbearers, and waterfowl raised in wetland environments have considerable economic value. For example, the muskrat harvest in Manitoba realized more than $2 million in 1981, $43 million was spent in B.C. on hunting derived from marshlands, and $38 million was spent in Alberta (Shay 1982). Migratory birds in Saskatchewan are estimated to provide $222 million worth of recreational benefits annually (Hanus 1974).

d) Wetlands contain rare and endangered species. The Piping Plover (*Charadrius melodus melodus*) is listed by COSEWIC (Committee on the Status of Endangered Wildlife in Canada) as threatened. The situation of having less than 100 pairs remaining in Alberta is attributed to the loss of wetland habitat. The species has disappeared in Manitoba (Reece 1984).

3. Scientific and cultural values

a) Wetlands provide laboratories for research and education. For example, a decade ago little was known about the nutrient stripping and water purification role of wetlands or their potential for aquaculture.

c) Wetlands provide recreational opportunities for hunters, fishermen, canoeists, birdwatchers, hikers, naturalists, photographers, and others with outdoor interests, and in so doing have a heritage function. These cultural values become increasingly important as the resource becomes scarcer.

c) Wetlands contribute to a more interesting landscape and fulfill a societal need for open space, variety, and other esthetics.

Summarizing, wetlands have significant hydrological, ecological, economic, and social values.

B. RANGE OF INTERESTED PARTIES

Provincial and federal government departments with an interest in wetlands include the following :

- Alberta Agriculture
- Alberta Energy and Natural Resources, Fish and Wildlife Division
- Alberta Environment, Planning Division
- Alberta Recreation and Parks
- Alberta Transportation
- Alberta Tourism
- Alberta Workers' Health, Safety, and Compensation
- Agriculture Canada
- Environment Canada — Canadian Wildlife Service,
  - Lands Directorate — Inland Waters

Other interested groups include :

- Private organizations
  - Ducks Unlimited
  - Wildlife Habitat Canada
- Farmers
- Trappers
- Native Organizations
- Recreational Groups
- Environmental Organizations

C. STATUS OF WETLANDS

A number of different agencies and authors have attempted to summarize the available literature on the quantity and quality of wetlands in Canada. Brace (1984) has estimated that wetlands are destroyed at a rate of up to 18 percent per year and further encroached on through intensive farming practices, which have impacted 61 percent of the remaining wetland margins. Data specific to Alberta is lacking. Most of the available information is pertinent to the Prairie Provinces. Goodman and Pryor (1982), working in the Black Soil Zone of the Prairie Provinces, estimated that 41.8 percent of the wetland loss due to total drainage occurred before 1950, and 25 percent since 1950. They concluded that this loss was significant and if continued, significant losses would occur over the next 20 years. Schick (1972) estimated that in the aspen parklands of Alberta, a 61 percent net loss of wetland area occurred between 1900 and 1970. In the Battle River Basin of Alberta, Ritter (1979) estimated that a 9 percent net loss of wetland habitat occurred between 1900 and 1978. Schmitt (1980) estimated a 21 percent gross loss of wetland habitat in the South Saskatchewan River Basin of Alberta between 1900 and 1979.

The Canadian Wildlife Service in Saskatoon is currently examining changes in the quantity and quality of prairie wetlands. They have identified a trend to decreasing wetland area from east to west, with the greatest losses occurring in Alberta (Brace 1984).

D. EXISTING POLICY IN ALBERTA

The characteristics of the water resource, its mobility, uneven distribution, and importance result in the management of water as a public resource. In western Canada, there are few incentives for protection, yet there are tax breaks for draining and clearing. The Wheat Board quota system has promoted draining and cultivation of marginal lands in the prairies through its delivery quota system. Over eight million acres of native vegetation have been cleared in Canada since 1976 to qualify for delivery quotas. Yet there are encouraging signs. The Alberta government recently advised the federal Environment Minister that Alberta will endorse the draft North American Waterfowl Management Plan. This plan proposes to spend over one billion dollars during the next five years in a joint U.S./Canada-sponsored habitat conservation program. The program will reimburse landowners for appropriate landowner practices. Wildlife Habitat Canada, a non-profit private organization, is examining various agencies, policies, and financial incentives affecting wetlands in Canada and sponsoring wetland habitat management projects across the country. The "Wetlands for Tomorrow" project, an agreement between Ducks Unlimited and the Alberta Government, has allocated money to upgrade 20 Alberta lakes and marshes.

E. IMPORTANCE OF A COMPREHENSIVE POLICY

Not all wetlands need to be preserved. It is important, however, to give equal consideration to both developed and undeveloped benefits of wetlands. This requires comprehensive wetland management and a provincial policy in which goals and objectives are clearly stated. Planning guidelines at both the provincial and municipal levels are required. At the very least, we need a continuation of the wetland drainage inventory begun by the Water Resources Commission and managed by the Planning Division of Alberta Environment to provide further development guidelines.

LITERATURE CITED

Brace, R.K. 1984. Title unknown. Paper presented at the Third Annual Western Provincial Conference on Rationalization of Water and Soil Research and Management. Winnipeg. 1984.

Goodman, A.S. and S.P. Pryor. 1972. *A Preliminary Study of the Methods and Rates of Alteration of Waterfowl Habitat in the Black Soil Zone of Western Canada.* Unpublished report. Prepared for the Canadian Wildlife Service. Edmonton. 77 pages.

Hanus, F. 1974. *Role of Birds in Recreational Activities of Saskatchewanians.* A report of research for the Canadian Wildlife Service Institute for Northern Studies. University of Saskatchewan. Saskatoon. 239 pages.

Reece, S.E. 1984. Endangered and threatened wildlife and plants: piping plover proposed as an endangered and threatened species. Federal Register 49 44712-44715. Department of Interior, Fish and Wildlife Service.

Ritter, A. 1979. *Wetland Reconnaissance Within the Battle River Basin: 1978 Summary.* Unpublished report. Prepared for Ducks Unlimited. Canada. 36 pages.

Schick, C.D. 1972. *A Documentation and Analysis of Wetland Drainage in the Alberta Parkland.* Unpublished report of the Western and Northern Region. Canadian Wildlife Service. 15 pages.

Schmitt, K. 1980. *Wetland Reconnaissance within the South Saskatchewan River Basin.* Unpublished report. Prepared for Ducks Unlimited. Canada. 29 pages.

Shay, J. 1982. "Wetland protection in the 80's." In *Ontario Wetlands Conference Proceedings,* pages 19-25. Federation of Ontario Naturalists, eds. Don Mills, Ontario. 193 pages.

Whittaker, R.H. 1970. *Communities and Ecosystems.* MacMillan Co., Toronto.

RESOLUTION 5

I. Conservation Strategy for Alberta

II. Be It Resolved:

THAT the Lieutenant-Governor in Council direct the Environment Council of Alberta to conduct public hearings on a Provincial Conservation Strategy for Alberta.

III. Background:

This study group believes it is in the public interest to provide the people of Alberta with an opportunity to contribute directly to the formulation of a Conservation Strategy for Alberta.

The Government of Canada, with the support of all 10 provinces, endorsed the World Conservation Strategy in 1981. This document stresses the need for sustainable use of our natural resources to ensure the survival and well-being of our species and our planet.

Since the provinces have most of the responsibilities for management of natural resources, it is important that each province prepare a conservation strategy which reflects its own unique characteristics and needs. Five provinces in addition to Alberta have conservation strategies in various stages of progress, but none has yet been completed.

The three Public Advisory Committees to the Environment Council of Alberta have prepared a prospectus document on a Provincial Conservation Strategy for Alberta. This document provides some background on the principles of the World Conservation Strategy, from which a provincial strategy would take its direction, but it also discusses the particular features of Alberta which need to be considered. The prospectus is, nevertheless, only the first step in the evolution of an actual Alberta Conservation Strategy, and this study group believes that the best way to develop such an important document is to fully involve all segments of Alberta society.

1) Public hearings have been found to be the most cost-effective means for obtaining a distillation of the views and concerns of the public at large on specific issues. Thorough and detailed contributions made in this forum will make public hearings the most efficient and direct way of ensuring a balanced, comprehensive, and integrated strategy with broad-based support.

2) The value of a Conservation Strategy is entirely dependent on the degree to which all elements of the public participate in its development.

3) The contribution of the public to the development of a Conservation Strategy will be exposed to the test of the marketplace of ideas, if a structured public hearing process is available.

4) A decision to call such hearings should be made as early as possible so that the background documentation which will facilitate informed public response will be of the best possible quality.

IV. References:

International Union for the Conservation of Nature and Natural Resources. 1980. *World Conservation Strategy.* IUCN: Gland, Switzerland. Various pagination.

Public Advisory Committees to the Environment Council of Alberta. 1985. *Prospectus for an Alberta Conservation Strategy*. Draft. Environment Council of Alberta. Edmonton. 109 pages.

V. **To Be Directed To :**

The Premier of Alberta
Minister of the Environment
All additional Ministers and Associate Ministers

VI. **Proposed by the Renewable Resources Study Group**

RESOLUTION 6

I. **Waste Management Program**

II. **Be It Resolved :**

THAT the Government of Alberta play a lead role in developing at-source separation of waste materials by encouraging and assisting municipalities to establish such programs, in order to reduce dependence on landfill disposal, and to increase the recovery and reuse of waste materials.

III. **Background:**

This study group supports a number of programs, such as the Oil Drop program, and the waste materials exchange, which are currently contributing effectively to achieving the "recovery and reuse" objective of this resolution. However, much remains to be done. Disposal of municipal waste material by landfilling is fraught with hazards and inefficiencies, and should be replaced as much as possible by alternatives aimed at conservation and reuse of waste materials for the following reasons :

1) The increasing domestic use of products containing potentially harmful chemicals and materials is resulting in a growing accumulation of their residues in landfill sites. This can lead to groundwater contamination and present a serious health hazard to nearby residents.

2) Landfill sites are very unpopular with local residents, and active resistance to proposed landfill sites can be expected.

3) The availability of land suitable for landfilling is declining, and distances to landfill sites will become greater as time passes.

4) The actual costs associated with landfilling are rapidly increasing. These include capital costs (escalating land prices, expensive site preparation), operating costs (greater haulage distances, groundwater monitoring, etc.), and reclamation costs.

5) The landfilling of recyclable materials imposes an unnecessary drain on our diminishing reserves of energy and materials, and constitutes a lost opportunity for Alberta businesses.

Because the responsibility for solid waste management falls primarily to municipal governments which have limited financial and human resources, the Government of Alberta should provide assistance in planning, funding, and promoting of improved solid waste management by any appropriate means. It is expected that at-source separation as an initial step will have the following effects:

1) A large portion of current urban solid wastes will be diverted from landfills.

2) Landfill sites will become much smaller, more manageable, and less offensive to the public.

3) The private waste management and secondary materials industry in Alberta will benefit.

4) The practice of separation will make people more conscious of their waste, and will induce many to reduce their waste production, including purchase decision in favor of products which offer reduced packaging or other waste residues.

IV. References:

Alberta Environment. 1979. *Recycling in Alberta: An Outline.* Waste Management Branch. Edmonton. 24 pages.

MacLaren Plansearch Lavalin. 1982. *Identification and Verification of Active and Inactive Land Disposal Sites in Alberta: Main Report.* Prepared for Alberta Environment and Environment Canada. Various pagination.

Taylor, P. and J. Powell. 1983. "Waste Hauler Shows How to Do Source Separation." *Resource Recycling* II(5): 14.

Wood, J.C. 1976. *A Survey of Solid Waste Disposal Methods in Alberta.* Environment Conservation Authority. Edmonton. 35 pages.

V. **To Be Directed To:**

Minister of the Environment
Minister of Municipal Affairs

Copies To:

Executive Director, Alberta Urban Municipalities Association
Mayors of Alberta cities

VI. **Proposed by the Urban Environment Study Group**

APPENDIX C. RESPONSES TO 1984 RESOLUTIONS

Resolution 1. Eastern Slopes Policy

Be It Resolved :

That the Government of Alberta continue to implement the 1977 Policy for Resource Management of the Eastern Slopes until the 1984 revision has been subjected to public hearings by the Environment Council of Alberta and changed accordingly.

Response :

The Government of Alberta cannot agree with this resolution. The Environment Council and its Public Advisory Committee may be assured that the revised document maintains the integrity of the original 1977 Eastern Slopes Policy while allowing increased emphasis on the development of tourism and recreational facilities in the Eastern Slopes. Watershed protection remains a high priority for the area, and the scenic and wildlife values of the Eastern Slopes will continue to be maintained and protected.

The document does have more flexibility so that the Government can consider all reasonable proposals. By the same token, we have more flexibility in designating areas for Prime Protection based on their ecological and aesthetic values regardless of their elevation, and aquatic habitats as well as terrestrial habitats can now be considered for designation as Critical Wildlife Zones.

The third "Background" paragraph refers specifically to watershed and implies that the policy for this resource has been changed. On the contrary, watershed protection remains the highest priority for the region. To quote the document, the goal for watershed management is "To ensure a continuous, reliable supply of clean water to meet the needs of Albertans and interprovincial users now and in the future" (pg. 2). This is the same as "protection of water quality for downstream users" which the resolution states is missing from the document.

Three other specific concerns are mentioned in the fourth "Background" paragraph: sale of public land, expansion of agriculture, and new oil and gas development. With respect to sale of public land, the policy states that most of the public lands in the Eastern Slopes will be retained in public ownership for the use of Albertans. This has certainly been the case historically and the intention is to maintain that emphasis. It is important to note that over the years there has been a net gain in public land ownership in the Eastern Slopes, particularly in the southern portion, as a result of acquisition of private land parcels. This trend is not expected to change materially.

The revised Policy does provide for the consideration of the sale of parcels of public land on a site-specific basis. This is primarily in recognition of the fact that it is difficult for the private sector to gain necessary financing of projects without having ownership of the land. Therefore, the sale of small parcels of land for intensive developments may be necessary where the development has been judged to be beneficial and in keeping with the resource management objectives for the area.

The objectives for agriculture are identified on page 9 of the policy. While these do allow for some expansion, particularly north of the Bow River, agricultural expansion will not threaten the overall management intent for the Eastern Slopes. This issue will be examined in each of the sub-regional plans which will be done to assist in the implementation of the policy.

The Eastern Slopes Policy has always provided for the exploration and development of petroleum and natural gas resources. The Prime Protection Zone is the only area in which the policy has stated this activity is not permitted. Even here, the 1977 policy stated that "an existing oil or gas field would be developed to the point of recovering the economic limits of the reserves." This statement is clarified in the 1984 document by identifying more specifically what a "step-out well" is and what conditions are necessary for this to apply (see page 16). Only five wells have qualified as "step-out" since 1977 and this level of activity is not expected to increase.

With respect to holding public meetings on this revised policy, the government feels this to be unnecessary. As emphasized in the policy, more detailed direction will be provided through sub-regional integrated resource plans. Public involvement will play a vital role in these sub-regional plans through information displays, discussions, and public meetings. To hold additional meetings on the Eastern Slopes Policy would be a costly duplication of effort with this public involvement program.

In addition the government has received public input since the 1977 Policy was written through the integrated planning program, and directly prior to approval of the 1984 revision, it was thoroughly reviewed by all government departments involved, MLAs, Cabinet Committees, and by Cabinet.

Resolution 2. Rocky Mountain World Heritage Sites

Be It Resolved :

That the Government of Alberta undertake the necessary agreements with the Federal Government to ensure the inclusion of the Willmore, White Goat, Siffleur, and Ghost River Wilderness Areas in the proposed Rocky Mountain World Heritage Site.

Response :

On November 1, 1984, the Honorable Suzanne Blais-Grenier informed the Department of Recreation and Parks of the approval of the nomination of the Canadian Rockies for the World Heritage List. At that time the opportunity was given to incorporate provincial lands into the nomination. The Government response to the Federal Government stated that participation in the Canadian Rockies Site nomination would be [inappropriate] considering the high quality and extensive area of the resource already represented in the present nomination.

Designation of the Wilderness Areas under Provincial jurisdiction might entail additional management constraints. These areas are adequately protected under the current provincial legislation and their inclusion in the site nomination would not add significantly to the value of the World Heritage Site currently approved.

Resolution 3. Surface Materials Reclamation Deposits

Be It Resolved :

That the Minister of the Department of Energy and Natural Resources initiate an amendment to the Surface Materials Regulations of the Public Lands Act to raise the present $250 per acre security deposit to reflect current costs.

Response :

The reclamation deposit required for surface materials operations on public lands is meant to provide sufficient funds for the Department of Energy and Natural Resources to reclaim the surface disturbed area in the event that the lessee is unable or unwilling to do the reclamation. Because it is an extremely rare circumstance for the Department to have to use the deposit, the present fee is high enough and possibly not necessary. Because of your resolution the matter of Crown protection by means of deposits, letters of credit, or guarantees will certainly be reviewed.

Resolution 4. Surface Materials, Fees, Rentals, and Royalties

Be It Resolved :

That the Minister of Energy and Natural Resources initiate a change to the Surface Materials Regulations of the Public Lands Act to increase the schedule of fees, rentals, and royalties to reflect current market values.

Response:

The Surface Materials Lease rental and royalties are being reviewed and this resolution will be considered in that review. Any changes to the rental or royalties will require an amendment of the Surface Materials Regulations. (See *The Public Lands Act Surface Materials Regulations* – A.R. 11/78 with amendments up to and including A.R. 44/78).

Resolution 5. Vehicle Emission Standards

Be It Resolved:

That the standards for vehicle emissions in Canada for the 1986 model year be amended to meet the standards that are currently in effect in the United States.

Response:

The Pollution Study Group of the Public Advisory Committee has correctly recognized that the regulatory authority over motor vehicle emissions is under the Motor Vehicle Safety Act administered by Transport Canada.

Consequently, Alberta Environment can only act in a recommendation capacity with respect to motor vehicle emissions. We are in favor of tightening emission standards and have indicated this position to Environment Canada.

The Pollution Study Group is no doubt aware of the recent announcement by the Federal Government regarding motor vehicle emissions. A part of the announcement included:

> *Tougher emission standards for cars and light duty trucks will come into effect on September 1, 1987 for the 1988 model year. The standards will have the effect of reducing nitrogen oxide emissions for new cars, which contribute to the acid rain problem, by 45 per cent.*
>
> *Current standards of 3.1 grams per mile driven for nitrogen oxides, 2.0 grams per mile driven for hydrocarbons, and 25.0 grams per mile driven for carbon monoxide will be reduced to levels of 1.0 grams per mile driven, 0.4 grams per mile driven and 3.4 grams per mile driven respectively. These standards are as tough as those in any other industrialized nation.*

Resolution 6. Continuation of Environment Week Conferences Annually in Alberta

Be It Resolved:

That, in conjunction with Environment Week each year, a public conference continue to be sponsored by Alberta Environment, and organized jointly with the Public Advisory Committees of the Environment Council of Alberta.

Response:

Alberta Environment agrees that it is important that Environment Week has a defined focal point to bring the attention of the public to concerns about the environment. Supporting a conference each year is certainly one way to meet this focus.

The conference, however, would have to meet broad public needs. The topic should respond to a wide and expressed public concern and interest. The content level of the conference would be such that the non-technical public could freely take part and be stimulated by it. In this way, public identification with the conference would bring about greater attention to Environment Week '85 and of the environment itself.

Alberta Environment is sponsoring a conference at the University of Alberta, June 1-2, 1985 that will initiate Environment Week '85 activities. The theme, Youth and the Environment, is in keeping with the Province's efforts to recognize the International Year of Youth declared by the United Nations.

The conference will focus on a variety of environmental issues presented by youth to an audience of between 175 and 250. Several agencies, including the Council, have been approached to assist with the organization of this event.

Resolution 7. History of the Environmental Movement in Alberta

Be It Resolved:

That a history of the environmental movement in Alberta, and an assessment of its accomplishments, is urgently needed, and that Alberta Environment now take the lead role by initiating the funding aspects of this work through its Environmental Education Resources Branch.

Response:

Though the department has made considerable effort in providing a historical perspective on various facets of the environmental and environmental education movements in Alberta it cannot, at this time, provide further support in this area.

As you have noted, the department has made a substantial effort already in putting the early years of the environmental movement in Alberta in perspective for

understanding where the movement may be heading in the future. The two issues of *Environment Views* entitled "The Environment Movement of the Eighties, Parts One and Two" (Vol. 7, Numbers 1 and 2) are valuable in providing an insight into the movement as a whole.

The Environmental Education Branch has contracted for the completion of the report *Environmental Education in Alberta: The Last Ten Years*. The report, in its final form, will be available for distribution later this year. The branch has already acted to use the information in the report in activities focussing on future action. The report will also undoubtedly be used in discussion with other agencies and should prove of value as a reference in developing program plans of a co-operative nature in the future. The branch has committed its available resources in the area for 1985-86 for the follow-up projects to this report.

APPENDIX D. PUBLIC ADVISORY COMMITTEE MEMBERSHIP LISTS

(as of November 1985)

Public Advisory Committee on the Environment

Sponsoring Organizations and Representatives

Alberta Association of Architects ..... Mr. A.M. Holland
Alberta Association of Canadian Institute of Planners ..... Mr. J. McLaughlin
Alberta Association of Landscape Architects ..... Mr. K.G. Carson
Alberta Association of Municipal Districts and Counties ..... Mr. S. Shwetz
Alberta Association of Registered Nurses ..... Mrs. S. Henderson
Alberta Beekeepers Association ..... Mr. R.D. McKenzie
Alberta Cancer Board ..... Mrs. G. Bako
Alberta Chamber of Commerce ..... Dr. A. Lamb
Alberta Chiropractic Association ..... Dr. R. Gehrke
Alberta Federation of Labour ..... Mr. A. Theobald
Alberta Fish and Game Association ..... Mr. H. Fauser and Mr. G. Merrick
Alberta Forest Products Association ..... Mr. A. Rytz
Alberta Institute of Agrologists ..... Dr. R. Cairns
Alberta Irrigation Projects Association ..... Mr. R. Jensen
Alberta Lung Association ..... Mrs. D.J. Lewoniuk
Alberta Medical Association ..... Dr. C. Hankins
Alberta Motion Picture Industry Association ..... Ms. L. Miller
Alberta Oil Sands Industry Environmental Association .... Mr. S.E. Stephansson
Alberta Pharmaceutical Association ..... Mrs. J. Roschlaub
Alberta Public Health Association ..... Mr. B. Alleyne
Alberta Research Council ..... Dr. R.J. Fessenden
Alberta School Trustees Association ..... Mrs. M. Stephenson
Alberta Trappers' Central Association ..... Mr. J. Wooders
Alberta Urban Municipalities Association ..... Alderman C. Reid
Alberta Veterinary Medical Association ..... Dr. A. Gerrow
Alberta Wheat Pool ..... Mr. H.R. Patching
Alberta Wilderness Association ..... Mr. J. Eisenhauer
Alberta Women's Institute ..... Mrs. M. Goodwin
Archaeological Society of Alberta ..... Mr. G.F. Paschen
Association of Professional Engineers,
Geologists and Geophysicists of Alberta ..... Mr. J.E. Staples
Calgary Chamber of Commerce ..... Mr. A. Chanin
Calgary Local Council of Women ..... Mrs. S. Nelson Pier
Canada West Foundation ..... Dr. D.K. Elton
Canadian Association of Re-Refiners ..... Mr. R. Kalmacoff

Canadian Institute of Forestry ..... Dr. P. Woodard
Canadian Institute of Public Health Inspectors
(Alberta Branch) ..... Mr. W. Irwin
Canadian Manufacturers' Association ..... Mr. A.M. Woffard
Canadian Meteorological and Oceanographic Society
(Alberta Centre) ..... Dr. L. Wojtiw
Canadian Nature Federation ..... Ms. M. Posey
Canadian Petroleum Association ..... Mr. G. Stewart
Canadian Society of Environmental Biologists
(Alberta Chapter) ..... Ms. R. Usher
Canadian Water Resources Association (Alberta Branch) ..... Mr. G. Sykes
Christian Farmers Federation ..... Mr. D. Kolk
Citizens for Public Justice ..... Mrs. J. Krabbe
City of Calgary ..... Ms. J. Lewin
City of Camrose ..... Dr. M. Muc
City of Drumheller ..... Mr. R. Romanetz
City of Fort McMurray ..... Alderman P. Van Belle
City of Fort Saskatchewan ..... Alderman D. Petroski
City of Grande Prairie ..... Mr. E.G. Radbourne
City of Leduc ..... Mr. M. Fitzpatrick
City of Lethbridge ..... Alderman W.R. Cousins
City of Lloydminster ..... Mrs. J. Sloan
City of Medicine Hat ..... Mr. J. Hirsch
City of Red Deer ..... Alderman L. Pimm
City of St. Albert ..... Mr. D. Fraser
City of Wetaskiwin ..... Mr. N. Carlson
Coal Association of Canada ..... Mr. A. Kennedy
Cold Lake Community Advisory Committee ..... Mr. D. Appleby
Community Planning Association of Alberta ..... Ms. A. Parkinson
Consumers' Association of Canada ..... Mrs. E.S. Hunter and Mrs. M. Lutz
Council of Alberta Rural Ratepayers' Associations ..... Mr. J.C. Finlay
Ducks Unlimited Canada ..... Mr. G.R. Stewart
Edmonton Chamber of Commerce ..... Mr. G. Cameron
Electric Utility Planning Council ..... Mr. J. Prostebby
Energy Resources Conservation Board ..... Mr. E.R. Brushett
Entomological Society of Alberta ..... Mr. J.A. Shemanchuk
Federation of Alberta Naturalists ..... Mr. H. Gardner
Foothills Protective Association ..... Mr. C. Blackburn, Jr.
Ft. Saskatchewan Regional Industrial Association ..... Mr. R.W. Lutz
Grande Prairie Chamber of Commerce ..... Mr. B. MacDonald
Health Unit Association of Alberta ..... Mrs. L. Feltham
Law Society of Alberta ..... Mr. D.R. Thomas
Lloydminster Chamber of Commerce ..... Mr. J. Weaver
National and Provincial Parks Association of Canada
(Calgary/Banff Chapter) ..... Ms. B. Beswick

National and Provincial Parks Association of Canada (Edmonton Chapter) . . . . . Dr. G. Swinnerton
Native Outreach . . . . . Mr. A. Willier
Northwestern Fishing Co-op . . . . . Mr. S. Linington
Outdoors Unlittered . . . . . Mrs. E. Martin
Save Tomorrow Oppose Pollution (STOP) . . . . . Mr. B. Staszenski
Sierra Club of Alberta . . . . . Ms. P. Kariel
Society for the Protection of Architectural Resources in Edmonton . . . . . Mr. C. Pickard
Solar Energy Society (Calgary Chapter) . . . . . Dr. J.E. Rapson
Southern Alberta Environmental Group . . . . . Ms. M. Bailey
Strathcona Industrial Association . . . . . Mr. I. Macdonald
Unifarm . . . . . Mrs. E. Friesen
United Farmers of Alberta Co-operative Ltd. . . . . Mr. C. Fawcett
University Womens' Club of Edmonton (Canadian Federation of University Women) . . . . . Mrs. P. Reschenthaler
Urban Development Institute of Alberta . . . . . Dr. D.E. King
Weed Control Research Society of Alberta . . . . . Dr. M. Hussain
Western Barley Growers' Association . . . . . Mr. S. Wiskel
Western Stock Growers' Association . . . . . Mr. E. Jarvis
Wildlife Society of Canada . . . . . Ms. R. Usher
Women of Unifarm . . . . . Mrs. K. Russell
YWCA . . . . . Mrs. R. Robinson

Educational Institutions and Representatives

Athabasca University . . . . . Dr.D. Kvill
Canadian Union College . . . . . Dr. P. Ramalingam
Concordia College . . . . . Dr. S. Dalton
Fairview College . . . . . Mr. T. Garner
Grande Prairie Regional College . . . . . Dr. J. Snyder
Keyano College . . . . . Mr. P. Rudiak
Lakeland College – Vermilion Campus . . . . . Dr. M.H. Chaudhry
Lethbridge Community College . . . . . Mr. B. Meller
Medicine Hat College . . . . . Dr. R. Mutch
Mount Royal College . . . . . Dr. K. Cummins
Northern Alberta Institute of Technology . . . . . Dr. W. Buchta
Olds College . . . . . Mr. R.A. Hill
Red Deer College . . . . . Mr. G. Fabris
Southern Alberta Institute of Technology . . . . . Mr. D.A. Clarke
University of Alberta . . . . . Dr. H. Madill and Mr. P.N.D. Seymour
University of Calgary . . . . . Mr. W.A. Ross
University of Lethbridge . . . . . Dr. J. Campbell

Non-Sponsored Members

The current list of unaffiliated members follows:

Mrs. S. Abercrombie
Ms. L. Allison
Mr. K.J. Blom
Mrs. D. Broadbent
Mr. W.D. Broughton
Mr. K. Driver
Dr. K. Pennifold
Mr. R.M. Richardson
Mr. W.K. Ross
Dr. R. Scace
Mr. A.C. Dunkley
Mr. W.A. Flook
Ms. J. Hedenstrom
Dr. M. Kostuch
Mr. E. Kure
Mrs. B. Paschen
Mrs. L. Scrabe
Mr. R. Whistance-Smith
Mr. N.S. White
Dr. J.C. Wood

Science Advisory Committee Members

Dr. C.B. Beaty
Dr. C.F. Bentley
Dr. H. Buckmaster
Dr. S. Dalton
Dr. W.A. Fuller
Dr. J. Hackler
Ms. L.P. Horstman
Dr. R.K. Lane
Dr. P. Mahaffy
Dr. R. Nursall
Dr. R.P. Pharis
Dr. W.E. Phillips
Dr. D. Thompson
Dr. W.H. Vanden Born
Dr. T.S. Veeman

Environmental Education Advisory Committee Members

Dr. L. Bakshi
Ms. S. Banks
Mr. B. Batycky
Ms. E. Beaubien
Mr. R. Ebel
Dr. L. Fenna
Mrs. J. Finlay
Mrs. C. Gardner
Dr. J. Godfrey
Dr. J. Guay
Mr. R. Ireland
Mr. L. Johnson
Mr. J. Robertson
Dr. W. Samiroden
Mr. D. Spalding
Mr. D. Stoker

APPENDIX E. LIST OF PUBLICATIONS

DECEMBER 1985

All publications listed are free upon request to the Environment Council. Single copies of up to 10 different publications may be ordered. Please do not waste printed material. Order only those publications which are actually needed and useful.

BROCHURES

Environment Council of Alberta. ECA document. July 1983.

Public Hearings.

What in the World is a Conservation Strategy?

LEGISLATION

The Environment Council Act. Chapter E-13, R.S.A. 1980.

ANNUAL REPORTS

Annual Report, 1980. (ECA81-AR)

Annual Report, 1981. (ECA82-AR)

Annual Report, 1982. (ECA83-AR)

Annual Report, 1983. (ECA84-AR)

Annual Report, 1984. (ECA85-AR)

PUBLICATIONS RELATED TO PUBLIC HEARINGS

The Conservation of Historical and Archaeological Resources in Alberta, May and June 1972.

Report and Recommendations. June 1973.

Land Use and Resource Development in the Eastern Slopes, June and July 1973.

Information Bulletins :

Oldman River Drainage Basin. Prepared by: The Oldman River Regional Planning Commission, March 1973.

Bow River Watershed Basin. Prepared by: The Calgary Regional Planning Commission, May 1973.

Athabasca – Yellowhead Area. Prepared by: Alberta Department of Municipal Affairs, May 1973.

Report of the Science Advisory Ad Hoc Committee. 1973.

Interim Reports:

Commercial Tourist Development Proposals. E.C.A. document, 1974.

Oldman River Basin. E.C.A. document, 1974.

North Saskatchewan and Red Deer River Basins. E.C.A. document, August 1974.

Athabasca River Basin. E.C.A. document, August 1974.

Smoky River Basin. E.C.A. document, September 1974.

The Use of Pesticides and Herbicides in Alberta, October and November 1974, January to April 1975.

Information Bulletins:

Terms of Reference, E.C.A. document, September 1974.

Biocide Use in Alberta, Part 1: Introduction and Registration. Prepared by: Science Advisory Ad Hoc Committee on Biocides, April 1974.

Biocide Use in Alberta, Part 4: The Use of Insecticides in Alberta. Prepared by: Science Advisory Ad Hoc Committee on Biocides, April 1974.

Report and Recommendations. February 1976.

Erosion of Land in Northwestern Alberta, January 1976.

Information Bulletins:

Water-Induced Erosion on Privately Owned Agricultural Lands in the Peace River Region: An Institutional and Legislative Analysis. Prepared by: W.E. Phillips; D. De Pape; and L.R. Brook, 1975.

Anthropogenic Erosion, Swan Hills, Alberta. Prepared by: Jean G. Langelle, January 1976. (2nd edition)

Report and Recommendations. November 1976.

Continued Public Hearings into the Flow Regulation of the Red Deer River, March 1977.

Information Bulletins:

Terms of Reference and Background Information. E.C.A. document, December 1976.

Red Deer River Basin. Preliminary Planning Report on Potential Damsites Upstream from Sundre. Prepared by: Alberta Environment, Planning Division, September 1976.

Red Deer River: Today and Tomorrow. A Management Statement. Prepared by: Alberta Environment, Planning Division, December 1976.

Report and Recommendations. June 1977.

Environmental Effects of Forestry Operations in Alberta, February and March 1978.

Information Bulletins:

Terms of Reference and Background Information. E.C.A. document, September 1977.

The Environmental Effects of Timber Production in Alberta: An Overview. Prepared by: D. De Pape and R. Collins for the Science Advisory Committee on Forestry, August 1977.

The Environmental Effects of Timber Production in Alberta: Institutional and Legislative Analysis. Prepared by: D. De Pape and W.E. Phillips for the Science Advisory Committee on Forestry, August 1977.

Potential for Biomass Energy Production in Alberta Based on Timber Resources. Prepared by: P.L. Richards, consultant, 1977.

Forest Utilization and its Environmental Effects in Alberta. Prepared by: W.R. Hanson, consultant, 1973. (updated)

The Environmental Effects of Timber Harvesting in Alberta: A Summary. Prepared by: C.D. Schultz and Company Limited, 1973.

Perspectives I: The Forestry Industry in the Peace River Region of Alberta. Prepared by: The Peace River Regional Planning Commission, September 1977.

Perspectives II: The Forestry Industry in Alberta. Contributions by the Alberta Forest Service, Alberta Department of Energy and Natural Resources and the Canadian Forest Service of the Federal Department of the Environment, November 1977.

Perspectives III: Fish and Wildlife Aspects of the Environmental Effects of Forestry Operations in Alberta. Prepared by: The Fish and Wildlife Division of the Alberta Department of Recreation, Parks and Wildlife, October 1977.

Forest Recreation in Alberta. E.C.A. document, March 1978.

Report and Recommendations. February 1979. (ECA79-13/RR)

Management of Water Resources within the Oldman River Basin, November 1978.

Information Bulletin:

Terms of Reference and Background Information. E.C.A. document, September 1978. (ECA78-14/IB1)

Report and Recommendations. August 1979. (ECA79-14/RR)

The Management and Disposal of Hazardous Waste, May and June 1980.

Information Bulletins:

Background Information for the Public Hearings on the Management and Disposal of Hazardous Waste. E.C.A. document, prepared by John Lilley, January 1980. (ECA80-15/IB1)

The Administration and Regulation of Hazardous Waste for the Public Hearings on the Management and Disposal of Hazardous Waste. E.C.A. document, prepared by T.J. Cottrell, January 1980. (ECA80-15/IB2)

Report and Recommendations. December 1980. (ECA80-15/RR)

Noise in Alberta, Spring/Summer 1981.

Brochures:

Noise: Transportation Noise. E.C.A. document prepared by M.E. Gordon, September 1980.

Noise: Planning Considerations. E.C.A. document prepared by M.E. Gordon, September 1980.

Noise Around the Home. E.C.A. document prepared by T. Cottrell, December 1980.

Information Bulletins:

Administration and Regulation of Noise in Alberta. E.C.A. document prepared by M.E. Gordon, December 1980. (ECA80-16/IB1)

Noise in the Workplace. Prepared by: John Throckmorton, Alberta Workers' Health Safety and Compensation, Occupational Health and Safety Division, January 1981. (ECA80-16/IB2)

Economic Aspects of Noise in Alberta. Prepared by: K.R. Wiens and J.R. Kinley, InterGroup Consulting Economists Limited, September 1980. (ECA80-16/IB3)

Noise in Alberta. E.C.A. document prepared by T. Cottrell, December 1980. (ECA80-16/IB4)

Noise is a Health Hazard. Prepared by: John Throckmorton, Alberta Workers' Health, Safety and Compensation, December 1980. (ECA80-16/IB5)

Report and Recommendations. July 1982. (ECA82-16/RR)

Maintaining and Expanding the Agricultural Land Base in Alberta, Fall 1983.

Information Bulletins:

Factors Affecting Summerfallow Acreage in Alberta. Prepared by: Marv Anderson and Associates Limited, August 1981. (ECA81-17/IB1)

Factors Affecting Summerfallow Acreage in Alberta: Summary. E.C.A. document prepared by Michael L. Kelly, August 1981. (ECA81-17/IB2)

The Agricultural Land Base in Alberta. E.C.A. document prepared by P.S. Thompson, August 1981. (ECA81-17/IB3)

The Agricultural Land Base in Alberta: Summary. E.C.A. document prepared by P.S. Thompson, November 1981. (ECA81-17/IB7)

Agricultural Land and Land Use Planning in Alberta: A Review of Planning Legislation and Practices. E.C.A. document prepared by M.E. Gordon, October 1981. (ECA81-17/IB4)

Agricultural Land and Land Use Planning in Alberta: Summary and Issues. E.C.A. document prepared by M.E. Gordon, November 1981. (ECA81-17/IB6)

Agriculture and the Environment. Prepared by: Kim Sanderson, November 1981. (ECA81-17/IB5)

Agriculture and the Environment: Summary. Prepared by: Kim Sanderson, March 1982. (ECA82-17/IB14)

Urbanization of Agricultural Land. E.C.A. document prepared by P.S. Thompson, December 1981. (ECA81-17/IB10)

Urbanization of Agricultural Land: Summary. E.C.A. document prepared by P.S. Thompson, December 1981. (ECA81-17/IB11)

Rural Subdivision in the Edmonton, Battle River, Red Deer, and Calgary Regional Planning Commissions, 1977 to 1979. E.C.A. document prepared by P.S. Thompson, February 1982. (ECA81-17/IB12)

Irrigation Agriculture in Alberta. E.C.A. document, March 1982. (ECA81-17/IB8)

Irrigation Agriculture in Alberta: Summary. Prepared by: Kim Sanderson, March 1982. (ECA81-17/IB9)

Dryland Salinity in Alberta. E.C.A. document prepared by John Lilley, March 1982. (ECA82-17/IB13)

Options for Protecting Agricultural Land. E.C.A. document prepared by M.E. Gordon, April 1982. (ECA82-17/IB15)

Soil Fertility and Land Productivity in Alberta. Prepared by: W.B. McGill, July 1982. (ECA82-17/IB16)

Fisheries and Wildlife Resources and the Agricultural Land Base in Alberta. Prepared by: William M. Glasgow, July 1982. (ECA82-17/IB17)

Economics of Agriculture in Alberta: Selected Issues. E.C.A. document prepared by Michael L. Kelly and Ellen Moreau, July 1982. (ECA82-17/IB19)

A Summary of the Economics of Agriculture in Alberta: Selected Issues. E.C.A. document prepared by Michael L. Kelly, July 1982. (ECA82-17/IB20)

An Analysis of Legislation Affecting Agricultural Land in Alberta. E.C.A. document prepared by John Lilley, July 1982. (ECA82-17/IB21)

Soil Fertility, Land Productivity and Dryland Salinity in Alberta: Summary. E.C.A. document prepared by Kim Sanderson, September 1982. (ECA82-17/IB22)

Agriculture and Public Land Management in Alberta. Prepared by: M.C. Taylor and K.R. Leggat, August 1982. (ECA82-17/IB23)

Greenhouse Production in Alberta. E.C.A. document prepared by Kim Sanderson, September 1982. (ECA82-17/IB24)

Maintaining and Expanding the Agricultural Land Base in Alberta Terms of Reference and Background Information, ECA document prepared by P.S. Thompson, July 1982. (ECA82-17/IB18)

The Impacts of Linear Developments, Resource Extraction, and Industry on the Agricultural Land Base. E.C.A. document prepared by Calvin Webb, October 1982. (ECA82-17/IB25)

The Impacts of Linear Developments, Resource Extraction, and Industry on the Agricultural Land Base: Summary. E.C.A. document prepared by Calvin Webb, October 1982. (ECA82-17/IB26)

Recreation on Agricultural Land in Alberta. Prepared by: Guy S. Swinnerton, November 1982. (ECA82-17/IB27)

Recreation on Agricultural Land In Alberta: Summary. E.C.A. document prepared by Kim Sanderson, November 1982. (ECA82-17/IB28)

Research and Agricultural Productivity in Alberta. Prepared by Marv Anderson and Associates Ltd. in co-operation with Alberta Agriculture, September 1982. (ECA82-17/IB29)

An Analysis of Agricultural Research and Productivity in Alberta. Prepared by Marv Anderson and Associates Ltd., January 1983. (ECA83-17/IB30)

Agricultural Land Protection Mechanisms in Canada. Prepared by E.W. Manning, Environment Canada, Lands Directorate, March 1983. (ECA83-17/IB31)

Summary Report and Recommendations. December 1984 (ECA 84-17/RR1)

Technical Report and Recommendations. March 1985 (ECA 85-17/RR2)

SPECIAL REPORTS

Review of Interaction Between Migratory Birds and Athabasca Oil Sands Tailings Ponds. Report and Recommendations. E.C.A. document, September 1975.

Economic Viability of Increased Beef Feeding in Alberta. Prepared by: Meat Industry Research Service Ltd., 1979. (ECA79-OP/2)

Management of Groundwater Resources in Alberta. Summary of a report prepared by Hydrological Consultants Ltd., 1979. (ECA79-OP/3)

Noise and the Human Environment. Edited by: H.W. Jones.

Volume 1, December 1979. (ECA79-SP/1 (v. 1/2))
Volume II, March 1980. (ECA79-SP/1 (v. 2/2))

A Report to the Environment Council of Alberta Regarding Health Complaints of Families Living in the Pincher Creek – Waterton, Alberta Area. Prepared by: Dr. E.E. McCoy, October 1980. Revised November 1980. (ECA80-SP/1)

Risks Associated with the Transportation to Treatment of Hazardous Waste Substances. Prepared by: F.G. Bercha and Associates Limited, December 1980.

Phase I. (ECA80-SP/2 (v. 1/2))
Phase II. (ECA80-SP/2 (v. 2/2))

Legal Aspects of Hazardous Waste Management. Prepared by: A.R. Lucas, January 1981. (ECA81-SP/1)

Public Perceptions of the Environment in Alberta. Prepared by: MIR Information Research Ltd., January 1981. (ECA81-SP/2)

Environmental Standards: A Comparative Study of Canadian Standards, Standard Setting Processes and Enforcement. Prepared by: M.A.H. Franson, R.T. Franson and A.R. Lucas, September 1983. (ECA83-SP/1)

STAFF REPORTS

Selenium, Animal Health and Sour Gas Plants. Prepared by: Dr. W.R. MacDonald and Dr. R.F. Klemm, 1973.

Commercial Supersonic Air Transportation in Alberta: A Preliminary Analysis of Environmental Impact Information. Prepared by: R.E. Rogers, April 1976.

Health Effects from Kraft (Sulphate) Pulp Mill Operations. Prepared by: M.P.G. Hawkes, September 1976.

The Camrose-Ryley Project Proposal (1975). A Preliminary Assessment of the Surface Reclamation Potential on the Dodds-Roundhill Coalfield. Prepared by: R.F. Laidlaw, April 1977.

Attitudes Toward the Environment: A Comparison of Six Surveys Spanning Six Years. Prepared by: Michael L. Kelly, February 1982. (ECA82-ST/2)

Wildlife Roadkills and Potential Mitigation in Alberta. Prepared by: Kim Sanderson, February 1983. (ECA83-ST/1)

The Use of Municipal Waste as Fuel. Prepared by: Calvin Webb, March 1983. (ECA83-ST/2)

Acid-Forming Emissions — Transportation and Effects. Prepared by: Kim Sanderson, March 1984. (ECA84-ST1)

CONFERENCES AND MEETINGS

Involvement and Environment: Proceedings of the Canadian Conference on Public Participation. Banff, Alberta, October 1977.

Volume 1, September 1978. (ECA78-CM/1(v.1/2))
Volume 2, May 1979. (ECA78-CM/1(v.2/2))

Public Participation in Environmental Decision Making: Strategies for Change. Proceedings of a National Workshop, Banff, Alberta, 1979. Edited by: Barry Sadler. (ECA80-CM/1)

The Viability and Livability of Small Urban Centres. Edited by Frank Jankunis and Barry Sadler. (ECA80-CM/2)

Reactions to the Public Participation Workshop, March 5, 1981. Prepared by: Alistair D. Crerar, May 1981. (ECA81-CM/1)

PUBLIC ADVISORY COMMITTEE ON THE ENVIRONMENT

Brochure:

Public Advisory Committees to the Environment Council of Alberta. E.C.A. document. December 1982.

Annual Meetings and Resolutions:

Proceedings of the Ninth Annual Meeting, 1979. (ECA80-PA/AR)

Proceedings of the 1980 Annual Joint Meeting. (ECA81-PA/AR)

Proceedings of the 1981 Annual Joint Meeting. (ECA82-PA/AR)

Proceedings of the 1982 Annual Joint Meeting. (ECA83-PA/AR)

Proceedings of the 1983 Annual Joint Meeting. (ECA84-PA/AR)

1978 Resolutions Passed at the Eighth Annual Joint Meeting.

1979 Resolutions Passed at the Ninth Annual Joint Meeting.

1980 Resolutions Passed at the Tenth Annual Joint Meeting. (ECA81-PA/1)

1981-82 Resolutions Passed at the Eleventh and Twelfth Annual Joint Meetings. (ECA83-PA/1)

Roles Document: Public Advisory Committee on the Environment. September 1978. (Revised June 1983.) (ECA79-PA/3)

Public Advisory Committee on Environmental Education: Proceedings of the First Alberta Conference on Environmental Education, May 1974. Report and Recommendations. 1974.

Report of the Public Advisory Committee on Environmental Education to the Environment Conservation Authority: Recommendations from the First Alberta Conference on Environmental Education. 1974.

SCIENCE ADVISORY COMMITTEE

Annual Reports:

Sixth Annual Report, 1977.

Seventh Annual Report, 1978. (SAC79-AR)

Eighth Annual Report, 1979. (SAC80-AR)

Occasional Papers:

Trace Elements in Coal: a Review. Prepared by: L.V. Hills and W. Jones, March 1981. (ECA81-SA/1)

APPENDIX F. LOCATION OF INFORMATION CENTERS

Banff

The Banff Centre
Box 1020
Banff, Alberta
T0L 0C0

Blairmore

Blairmore Municipal Library
Blairmore, Alberta
T0K 0E0

Bonnyville

Bonnyville Municipal Library
Box 1438
Bonnyville, Alberta
T0A 0L0

Brooks

Brooks Public Library
Box 1149
Brooks, Alberta
T0J 0J0

Calgary

Calgary Public Library
Business and Science
616 McLeod Trail SE
Calgary, Alberta
T2G 2M2

Calgary Regional Planning Commission
4303 - 11 Street SE
Calgary, Alberta
T2G 4X1

Collections Room
Dept. of Geography
University of Calgary
2920 - 24 Avenue NW
Calgary, Alberta
T2N 1N4

Environmental Design Unit, 8th Floor
Library Tower
University of Calgary
2920 - 24 Avenue NW
Calgary, Alberta
T2N 1N4

Mount Royal College
4825 Richard Rd SW
Calgary, Alberta
T3E 6K6

Resource Centre Office
Faculty of Environmental Design
Room 1003A
Earth Science Building
University of Calgary
2920 - 24 Avenue NW
Calgary, Alberta
T2N 1N4

Camrose

Camrose Public Library
4863 - 50 Street
Camrose, Alberta
T4V 1P6

Canmore

Canmore Public Library
Box 460
Canmore, Alberta
T0L 0M0

Carstairs

Carstairs Library
Box 128
Carstairs, Alberta
T0M 0N0

Coronation

Coronation Community Library
Coronation School
Coronation, Alberta
T0K 1C0

Drumheller

Drumheller Public Library
Box 1599
Drumheller, Alberta
T0J 0Y0

Edmonton

Alberta Environment Library
14th Floor
Oxbridge Place
9820 - 106 Street
Edmonton, Alberta
T5K 2J6

Alberta Legislature Library
Room 216
Legislature Building
Edmonton, Alberta
T5K 2B6

Edmonton Regional Planning Commission Library
602, 10025 - 106 Street
Edmonton, Alberta
T5J 1G6

Government Publications
University of Alberta Library
Edmonton, Alberta
T6G 2J8

Edson

Edson Public Library
Box 249
Edson, Alberta
T0E 0P0

Fort McMurray

Fort McMurray Public Library
9912A Franklin Avenue
Fort McMurray, Alberta
T9H 2K6

Grande Prairie

Grande Prairie Public Library
10032 - 100 Avenue
Grande Prairie, Alberta
T8V 0V3

APPENDIX G. DISTRIBUTION OF PROCEEDINGS

A complete set of the proceedings of each public hearing we conduct will be available for use in the following ECA information centres. Proceedings and original copies of briefs may also be viewed at our own library.

Battle River Regional Planning Commission Library
5014 - 40 Avenue
Wetaskiwin, Alberta
T9A 0M9

Brooks Public Library
Box 1149
Brooks, Alberta
T0J 0J0

Buchanan Resource Centre
Lethbridge Community College
Lethbridge, Alberta
T1K 1L6

Calgary Public Library
Business and Science
616 McLeod Trail SE
Calgary, Alberta
T2G 2M2

Camrose Public Library
4863 - 50 Street
Camrose, Alberta
T4V 1P6

Collections Room
Dept. of Geography
University of Calgary
2920 - 24 Avenue NW
Calgary, Alberta
T2N 1N4

Drumheller Public Library
Box 1599
Drumheller, Alberta
T0J 0Y0

Environmental Design Unit
8th Floor
Library Tower
University of Calgary
2920 - 24 Avenue NW
Calgary, Alberta
T2N 1N4

Fort McMurray Public Library
10012 Franklin Avenue
Fort McMurray, Alberta
T9H 2K6

Government Documents Office
University of Lethbridge Library
Lethbridge, Alberta
T1K 3M4

Government Publications
The Library
University of Alberta
Edmonton, Alberta
T6G 2J8

Grande Prairie Public Library
10032 - 100 Avenue
Grande Prairie, Alberta
T8V 0V3

Lakeland College Library
Vermilion, Alberta
T0B 4M0

Lethbridge Public Library
810 - 5th Avenue S
Lethbridge, Alberta
T1J 4C4

Alberta Environment Library
14th Floor
Oxbridge Place
9820 - 106 Street
Edmonton, Alberta
T5K 2J6

Calgary Regional Planning Commission Library
4303 - 11 Street SE
Calgary, Alberta
T2G 4X1

Red Deer Public Library
4818 - 49 Street
Red Deer, Alberta
T4N 1T8

Red Deer Regional Planning Commission Library
2830 Bremner Avenue
Red Deer, Alberta
T4N 5Y5

South Peace Regional Planning Commission Resource Centre
200 Windsor Court
9835 - 101 Avenue
Grande Prairie, Alberta
T8V 0X6

Resource Centre Office
Faculty of Environmental Design
Room 1003A
Earth Science Building
University of Calgary
Calgary, Alberta
T2N 1N4

The Banff Centre
Box 1020
Banff, Alberta
T0L 0C0

The Library
Mount Royal College
4825 Richard Road SW
Calgary, Alberta
T3E 6K6

Vermilion Public Library
Box 476
Vermilion, Alberta
T0B 4M0

Whitecourt Public Library
PO Box 150
Whitecourt, Alberta
T0E 2L0

South Peace Regional Planning Commission
Resource Centre
200 Windsor Court
9835 - 101 Avenue
Grande Prairie, Alberta
T8V 0X6

Hinton

Hinton Municipal Library
Box 818
Hinton, Alberta
T0E 1B0

Lacombe

Parkland Regional Library
Alberta Agriculture Building
Lacombe, Alberta
T0C 1S0

Lacombe Public Library
Lacombe, Alberta
T0C 1S0

Lethbridge

Buchanan Resource Centre
Lethbridge Community College
Lethbridge, Alberta
T1K 1L6

Government Documents Office
University of Lethbridge Library
Lethbridge, Alberta
T1K 3M4

Lethbridge Public Library
810 - 5th Avenue S
Lethbridge, Alberta
T1J 4C4

Library
Oldman River Regional Planning Commission
905 - 4th Avenue S
Lethbridge, Alberta
T1J 4E4

Olds

Olds Municipal Library
Box 968
Olds, Alberta
T0M 1P0

Peace River

Peace River Municipal Library
9807 - 97 Avenue
Peace River, Alberta
T0H 2X0

Red Deer

Red Deer Public Library
4818 - 49 Street
Red Deer, Alberta
T4N 1T9

Red Deer Regional Planning Commission Library
2830 Bremner Avenue
Red Deer, Alberta
T4R 1M9

Reader's Service Librarian
Red Deer College Library
56 Ave & 32 Street
Red Deer, Alberta

Sherwood Park

County of Strathcona Municipal Library
Government Documents Section
2001 Sherwood Drive
Sherwood Park, Alberta
T8A 3J4

Spruce Grove

Spruce Grove Public Library
Box 2759
Spruce Grove, Alberta
T0E 2C0

Vegreville

Vegreville Public Library
Box 129
Vegreville, Alberta
T0B 4L0

Vermilion

Lakeland College Library
Vermilion, Alberta
T0B 4M0

Westlock

Westlock Municipal Library
Box 1198
Westlock, Alberta
T0G 2L0

Wetaskiwin

Battle River Regional Planning Commission Library
5014 - 48 Avenue
Wetaskiwin, Alberta
T9A 0M9

Whitecourt

Whitecourt Public Library
Box 150
Whitecourt, Alberta
T0E 2L0